DADF-H1

SERVICE MANUAL

REVISION 0

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Canon

MAR.2001 **FY8-13HA-000**

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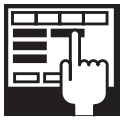
Caution

Use of this manual should be strictly supervised to avoid disclosure of confidential information.

1 Symbols Used

This documentation uses the following symbols to indicate special information:

Symbol	Description
	Indicates an item of a non-specific nature, possibly classified as Note, Caution, or Warning.
	Indicates an item requiring care to avoid electric shocks.
	Indicates an item requiring care to avoid combustion (fire).
	Indicates an item prohibiting disassembly to avoid electric shocks or problems.
	Indicates an item requiring disconnection of the power plug from the electric outlet.
Memo	Indicates an item intended to provide notes assisting the understanding of the topic in question.
REF.	Indicates an item of reference assisting the understanding of the topic in question.
	Provides a description of a service mode.
	Provides a description of the nature of an error indication.
	Refers to the Copier Basics Series for a better understanding of the contents.

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2 Outline of the Manual

This Service Manual contains basic facts and figures needed to service the DADF-H1 in the field, and it consists of the following chapters:

Chapter 1	General Description:	features, specifications, methods of operation
Chapter 2	Outline of Operation:	mechanical systems by function, electrical systems in reference to principles of operation, timing of operation; construction and outline of electrical circuitry
Chapter 3	Mechanical Systems	construction of mechanical systems; disassembly, assembly, and adjustments
Chapter 4	Maintenance and Inspection:	periodically replacement parts, durables and consumables; scheduled servicing chart
Chapter 5	Troubleshooting	standards, adjustments, troubleshooting tables
Appendix:		general timing chart, list of signals/abbreviations, general circuit diagrams

For installation, refer to the Installation Procedure found in the shipping box; this manual omits descriptions of the installation work.

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The descriptions in this Service Manual are based on he following rules:

1. In each chapter, the uses of the function in question and its relationship to electrical and mechanical systems are discussed and the timing of operation of its associated parts is explained by means of outlines and diagrams.
   In the diagrams, the symbol represents a mechanical path, while the symbol with a name next to it indicates the flow of an electric signal.
   The expression “turn on the power” means turning on the power switch, closing the front door, and closing the delivery door so that the machine will be supplied with power.
2. In circuit diagrams (digital), a signal whose level is High is expressed as being ‘1’, while a single whose level is Low is expressed as being ‘0’; the level of voltage, however, varies from circuit to circuit.
   The machine uses CPUs, whose internal mechanisms cannot be checked in the field, and, therefore, are not explained. In addition, the machine’s PCBs are not intended for repairs at the user’s and, therefore, are explained by means of block diagrams: two types are used, i.e., between sensors and inputs of PCBs equipped with a control or drive function and between outputs equipped with a control or drive function and loads; in addition, functional block diagrams are used at times.

Changes made to the machine for product improvement are communicated in the form of a Service Information bulletin as needed. All service persons are expected to go through all service documentation including the bulletins and be equipped to respond to the needs of the field (as by being able to identify possible causes of problems).

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CHAPTER 1

GENERAL DESCRIPTION

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1 Features

a. Flow scanning

Scanning is effected by flow scanning in all modes.

b. Document size recognition

The ADF recognizes document sizes in the length direction (feed direction) and in the width direction and forwards the document size information to the host to which the ADF is attached.

c. Double-sided document handling

Their reversal feature enables the ADF to handle double-sided documents.

d. Long-document mode

Long-document mode, when specified, allows the ADF to scan documents up to 630 mm long.

e. Mixed loading of different sizes of documents adhering to different systems

The ADF supports mixed loading of documents of two different sizes.

* Mixed loading of documents of different sizes adhering to the AB and inch system is not permitted.

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2 Specifications

2.1 Specifications

Item	Specifications	Remarks
Document pickup method	Automatic pickup/delivery method	
Document set direction	Document tray pickup: Face-up loading	
Document set position	Document tray pickup: Center standard	
Document separation method	Top separation	
Document type	Single-sided sheet document: AB system 38 to 128 g/m^2 Inch system 50 to 128 g/m^2 Double-sided sheet document: 50 to 128 g/m^2	60 to 90 g/m^2 for documents longer than 432 mm / 17.01 in
Document size	AB system B6/A5/B5/A4/A5R/A4R/B4/A3 Inch system STMT/LTR/LTRR/LGL/11"x 17"	Single-sided documents up to 630 mm / 24.80 in long available for scanning in long-document mode
	Document width: 148 (A5R) to 297 (A3) mm / 5.83 (A5R) to 11.69 (A3) in Document length: 128 (STMT) to 432 (11" x 17") mm / 5.04 (STMT) to 17.01 (11 x 17) in	With paper weighing 80 g/m^2 or lighter
Document tray loading capacity	50 sheets	
Document delivery station loading capacity	50 sheets	With paper weighing 80 g/m^2 or lighter
Document processing mode	Single-sided and double-sided document handling	With paper weighing 80 g/m^2 or lighter
Document size recognition	Yes (Standard sizes only)	With paper weighing 80 g/m^2 or lighter
Leftover document recognition	Available in conjunction with the host Mixed loading of documents of different sizes adhering to the same system	
Mixed document loading feature	Mixed loading of documents of different sizes adhering to different systems • Mixes of document sizes adhering to different systems available for loading AB system A3/B4 A4/B5 B4/A4R B5/A5	
Book document	Handled (documents up to 50 mm / 1.97 in in thickness only)	

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Item	Specifications	Remarks
Communication with the host	IPC Communication 2.1	
Input power requirement	DC24V Supplied from the host to which the	
Mass	ADF is attached.	
Physical dimensions	Approx. 14 kg / 30.8 lb 565 (width) x 538 (depth) x 124 (height) mm / 22.24 (width) x 21.18 (depth) x 4.88 (height) in	
Unit addresses	A-system: XDDxxxxx Inch/A-system: XDCxxxxx AB system: XDBxxxxx Inch/AB system: XDExxxxx	
Operating environment		
Temperature range	Conforming to the host.	
Humidity range	Conforming to the host.	

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Specifications and other information are subject to change without notice.

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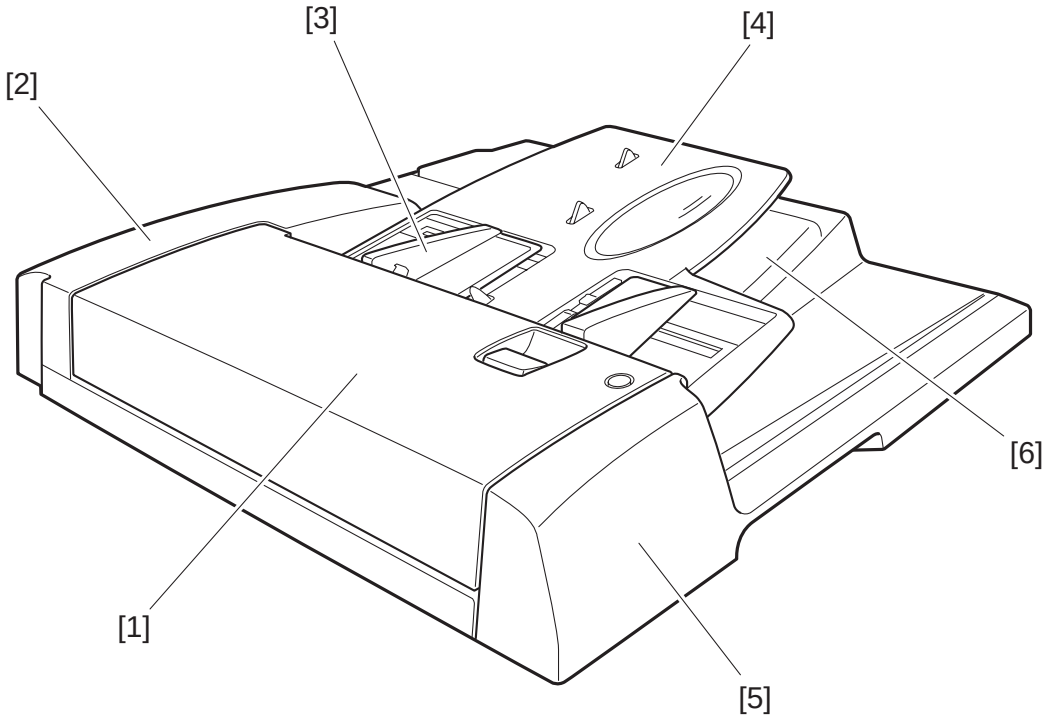
3 Names of Parts

3.1 Exterior View



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[1]	Feeder cover	[4]	Document pickup tray
[2]	Rear cover	[5]	Front cover
[3]	Slide guide	[6]	Document delivery station

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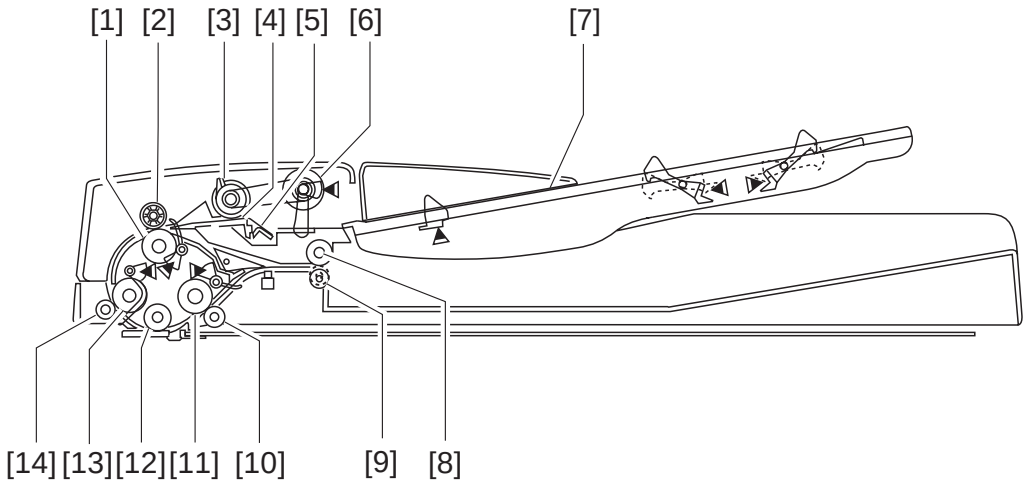
3.2 Cross-Sectional View



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[1]	Registration roller, lower	[8]	Delivery reversal roller, upper
[2]	Registration roller, upper	[9]	Delivery reversal roller, lower
[3]	Separation roller	[10]	Read roller 2 roller
[4]	Separation pad	[11]	Read roller 2
[5]	Separation plate	[12]	Platen roller
[6]	Pickup roller	[13]	Read roller 1 roller
[7]	Document pickup tray	[14]	Read roller 1

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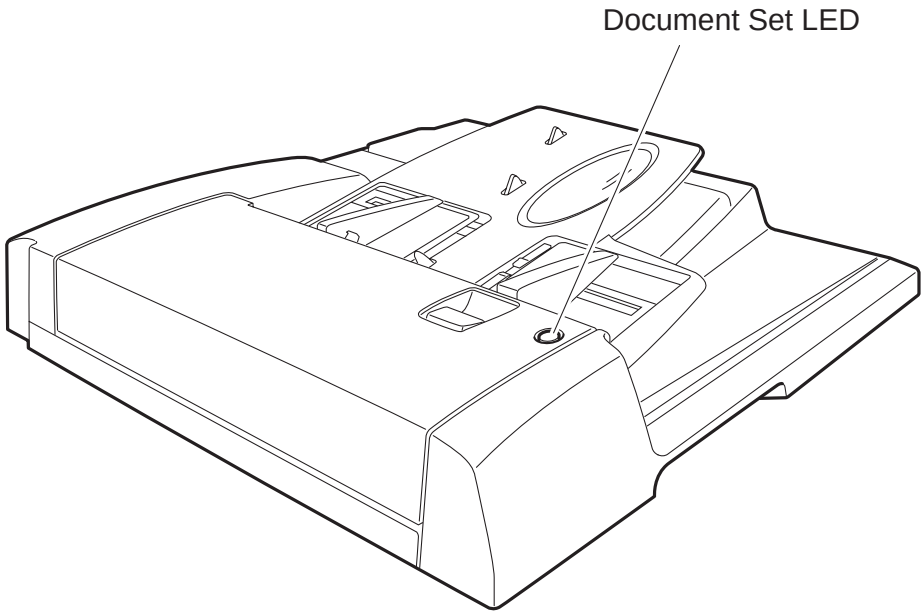
4. Operation Descriptions

4.1 Document Set LED

The Document Set LED lights when a document is set in the document tray and flashes when a document jams.



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4.2 Alarm Indications and Corrective Action

If the Document LED flashes while feeding a document, the document may have jammed. Take corrective action as follows:

1) Remove the entire document from the document tray.
2) Opening the feeder cover, remove any jammed document.
3) Set the document in the ADF again after aligning it, from the first sheet afterwards.

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4.3 Daily Customer Checks

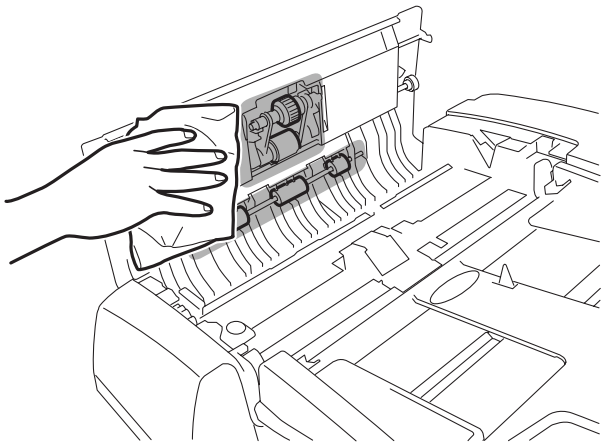
Instruct the user to clean the following points at least once each month:

Cleaning point	Cleaning method	Remarks
Rollers	After wiping with a cloth saturated with water, then wrung tight or moistened with alcohol, wipe dry.	
Platen roller		
Blank plate (crimp plate)		
Document table glass		• Reader station part
Document table glass retainer		• Reader station part

T01-403-01

Perform cleaning in the following sequence:

1) Opening the feeder cover, clean the rollers (5) under the feeder cover with a cloth saturated with water, then wrung tight while turning them and then wipe dry with a soft, dry cloth.
Clean the areas surrounding the rollers likewise.



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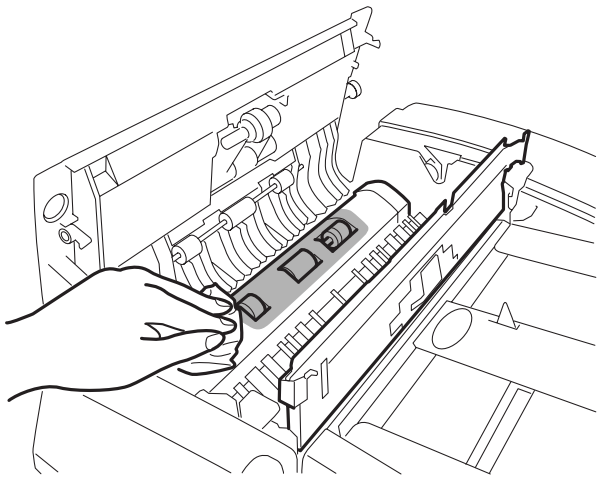
2) Opening the separation guide, clean rollers (3) with a cloth saturated with water, then wrung tight while turning them and then wipe dry with a soft, dry cloth.
Clean the areas surrounding the rollers likewise.



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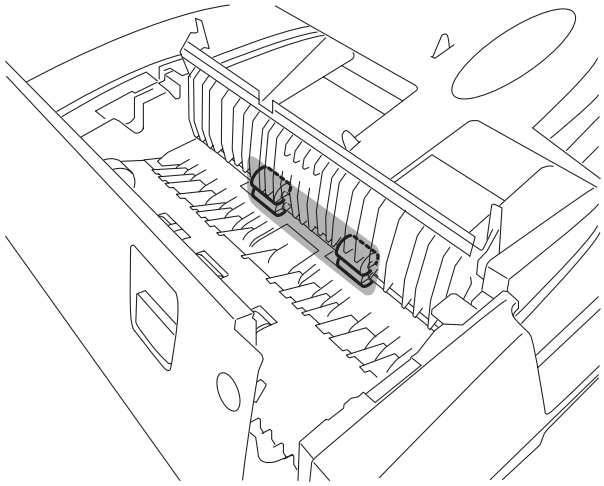
3) Turning rollers (4) with knob, clean them with a cloth saturated with water, then wrung tight while turning them and then wipe dry with a soft, dry cloth.



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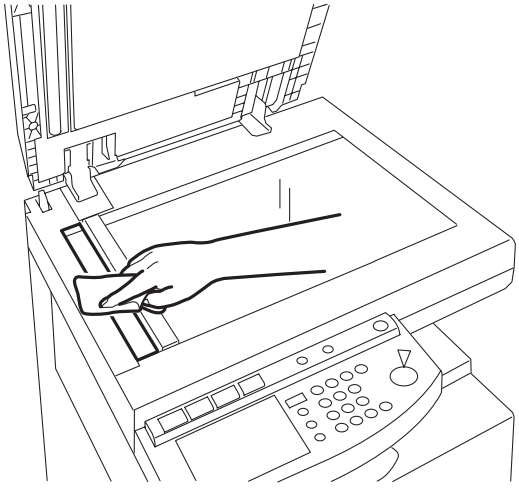
4) With the separation guide and the feeder cover closed, open the ADF. Clean the document table glass with a cloth saturated with water, then wrung tight while turning them and then wipe dry with a soft, dry cloth.



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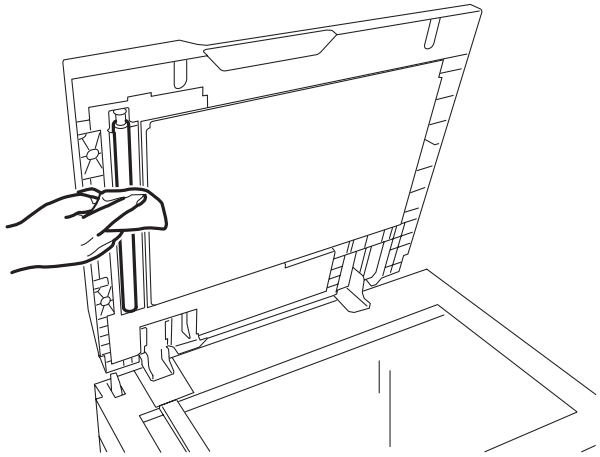
5) Clean the platen roller with a cloth saturated with water, then wrung tight while turning them and then wipe dry with a soft, dry cloth.
Clean the sheets surrounding the rollers likewise.
When the cleaning is completed, close the ADF.



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CHAPTER 2

OUTLINE OF OPERATION

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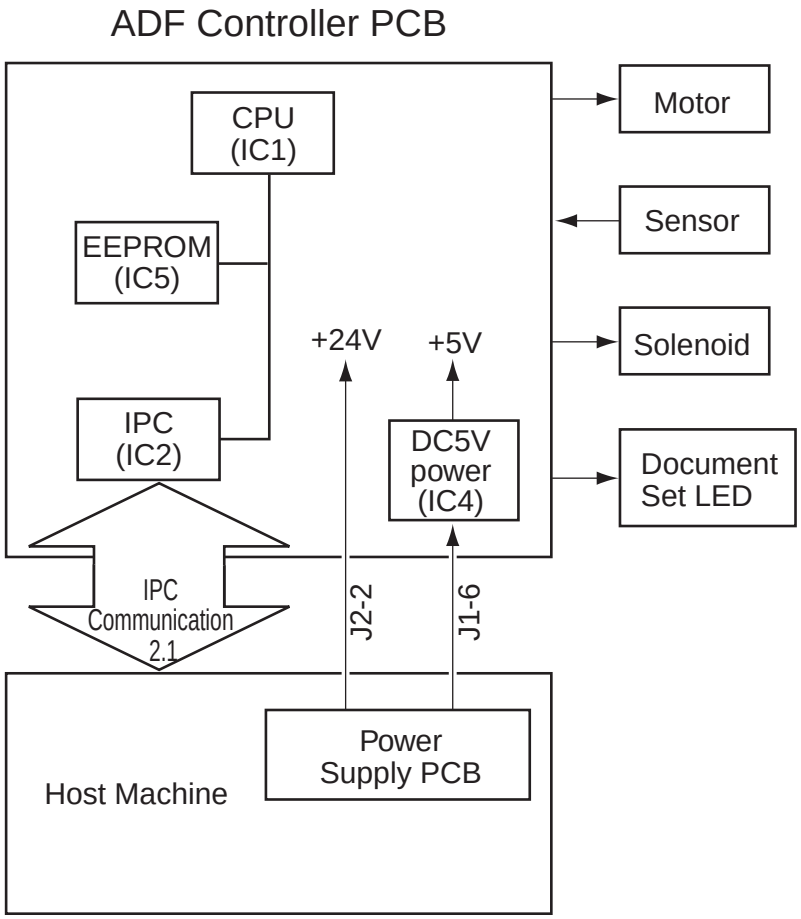
1 Basic Configuration

1.1 Electrical Circuit Schematics

This ADF is electrically controlled by the ADF controller PCB. A CPU (IC1) mounted on the ADF controller PCB decodes signals input signals from sensors and other sources and signals from the host and generates signals at predetermined timings for driving DC loads, such as motors and solenoids.



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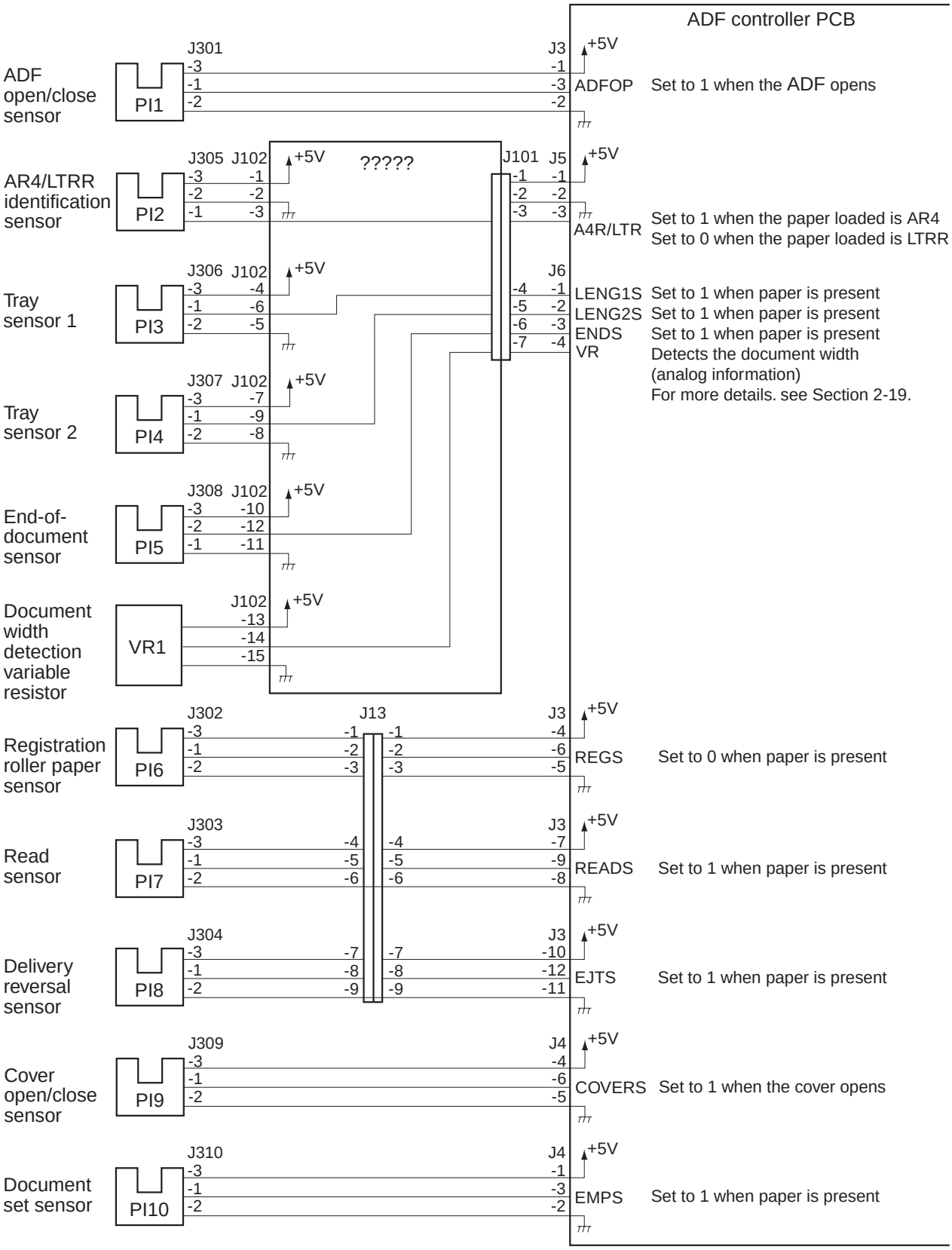
1.2 ADF Controller PCB Input

ADF controller PCB input (1/1)



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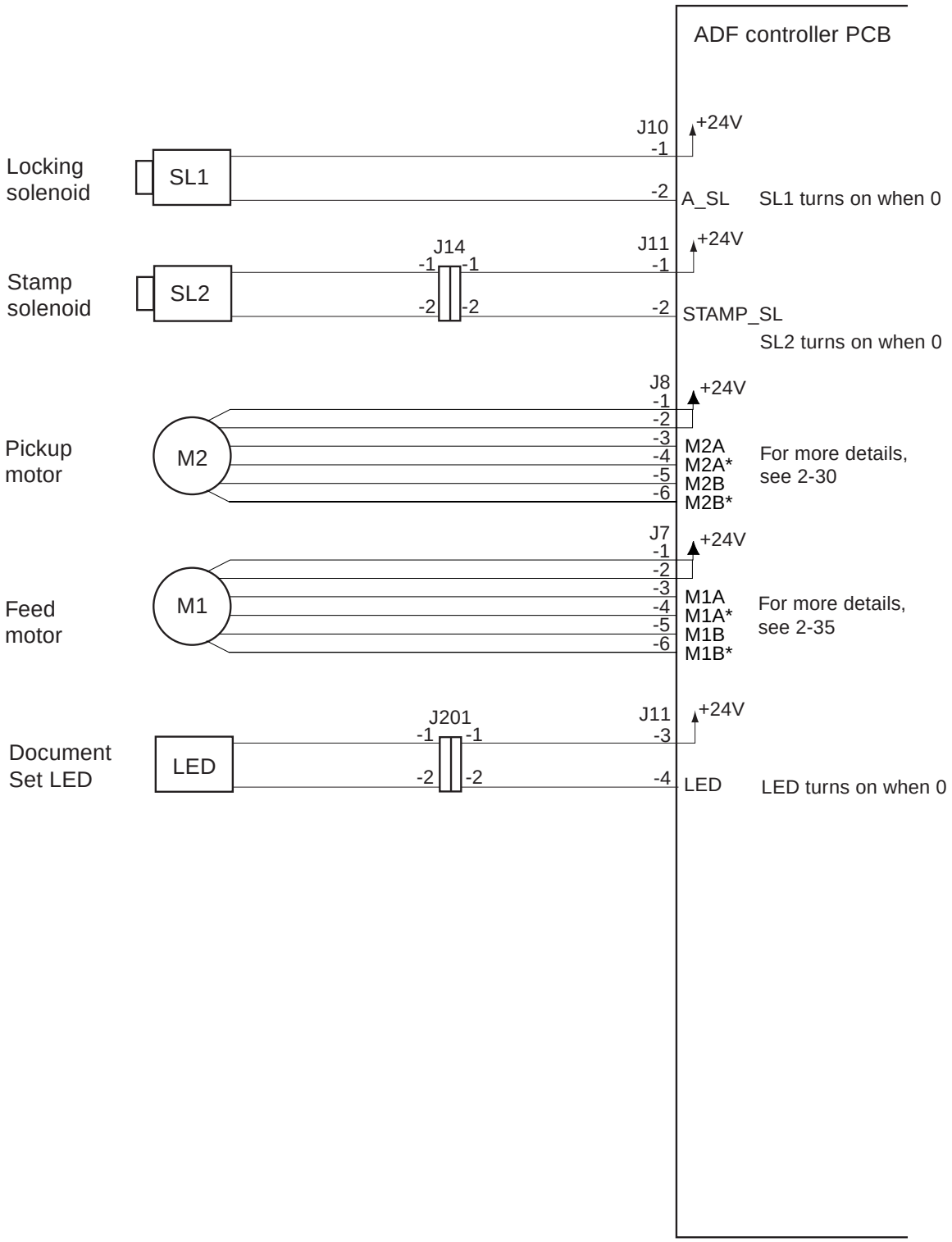
1.3 ADF Controller PCB Output

ADF controller PCB output (1/1)



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2. Basic Operations

2.1 Overview

This machine is a flow-scanning document feeder that uses two motors to drive document pickup and feeding.

Name (Symbol)	Function
Pickup motor (M2)	Separates and feeds documents.
Feed motor (M1)	Feeds documents.

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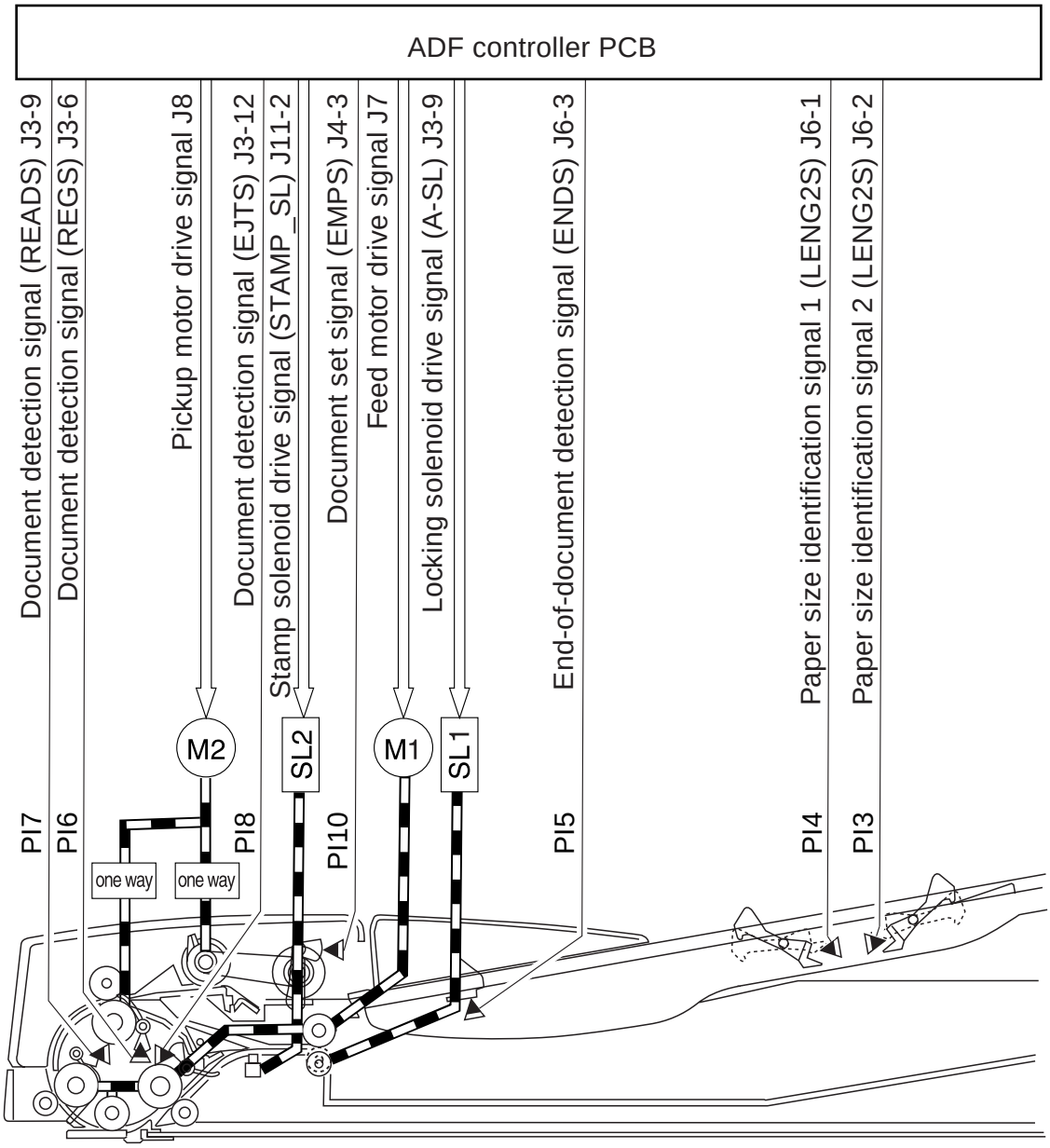
A drive block diagram of this ADF is shown below.



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2.2 Operations

2.2.1 Overview

This ADF supports four modes of operation as mentioned below. It chooses from among these operation modes as directed from the host and executes the specified print operation. The table below lists the names of the operation modes supported by this ADF, along with summary descriptions of their operations and the associated print modes.

Operation mode name	Operation summary	Associated print modes
[1] Forwarding pickup/delivery	Picks up a document, then delivers it when its scan is completed.	Single-sided document -> Single-sided print Single-sided document -> Double-sided print
[2] Forwarding pickup/reversal delivery	Picks up a document, then delivers it, reversed, when its scan is completed.	Double-sided document -> Double-sided print Double-sided document -> Single-sided print
[3] Idle feed/reversal pickup/reversal delivery	Idle-feeds a document first to establish its document size, then to scan it on its surface, and picks it again for scanning, followed by reversal and delivery.	Double-sided documents of different sizes adhering to different systems -> Double-sided print Double-sided documents of different sizes adhering to different systems -> Single-sided print
[4] Idle feed/reversal pickup /delivery	Idle-feeds a document to establish its document size, then reverses it for scanning, followed by delivery.	Single-sided documents of different sizes adhering to different systems -> Single-sided print Single-sided documents of different sizes adhering to different systems -> Double-sided print Long document -> Single-sided print

T02-202-01

The small and large document sizes are as follows:

Small sizes: B6, A5R, A5, A4, B5, LTR, STMT
Large sizes: A4R, B5R, A3,B4,LTRR, LGL, 279.4 X 431.8mm (11" X 17")

T02-202-02

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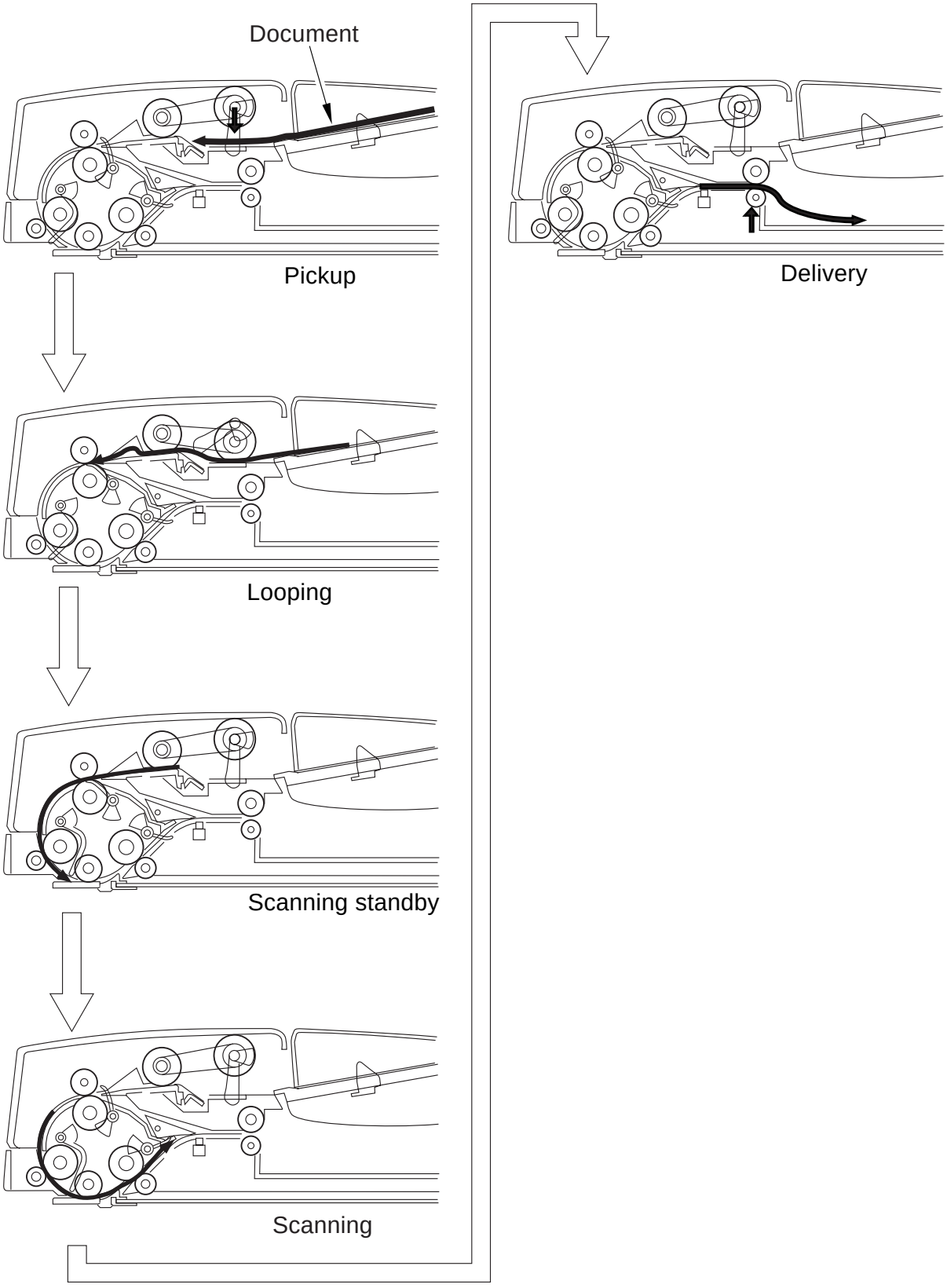
2.2.2 Forwarding pickup/delivery (Single-sided document -> Single-sided print)

The flow of document handling is schematically shown below.



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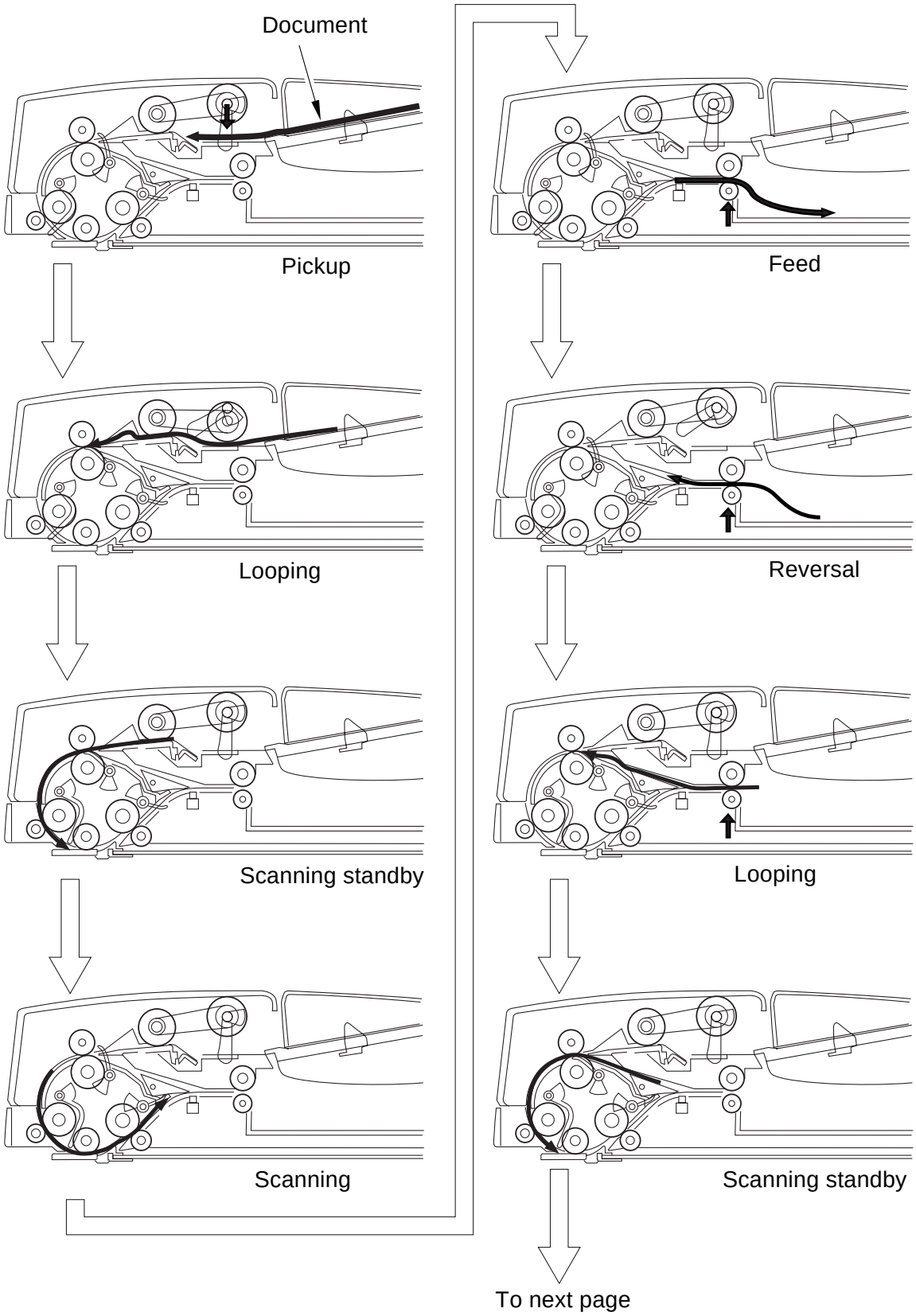
2.2.3 Forwarding pickup/reversal delivery (Double-sided document -> Double-sided print)

The flow of document handling is schematically shown below.



F02-202-02a

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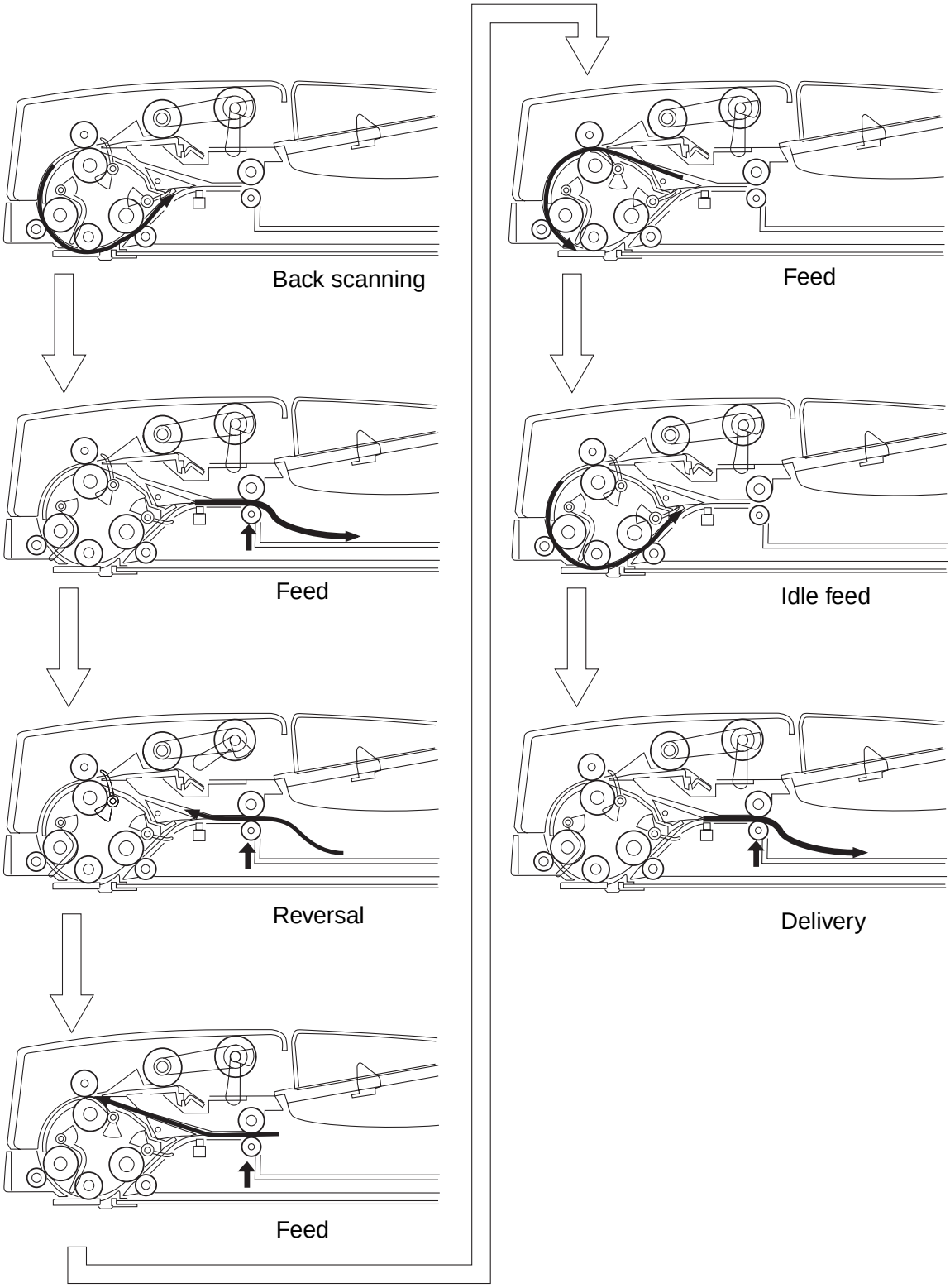
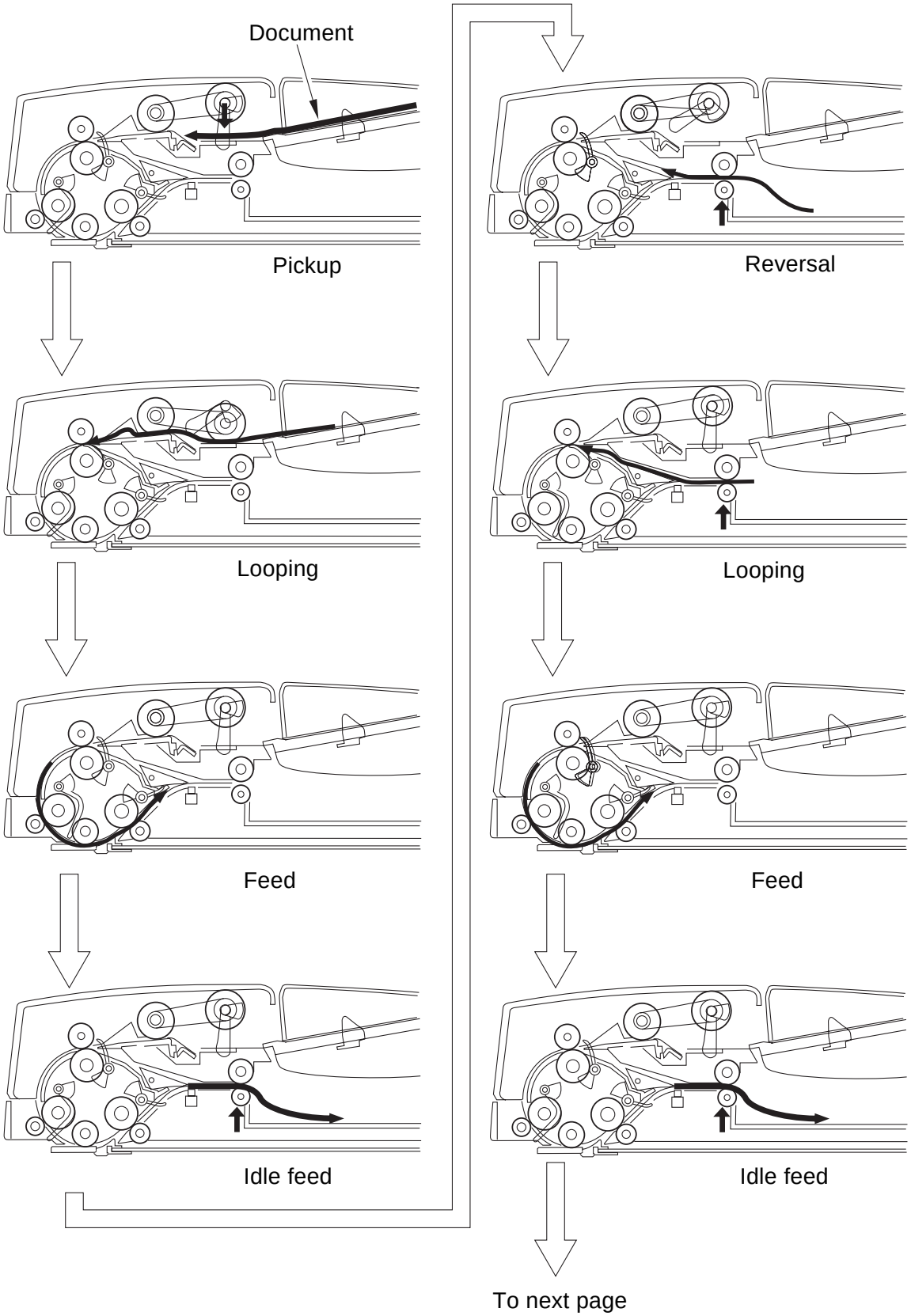


F02-202-02b

2.2.4 Idle feed/reversal pickup/reversal delivery (Double-sided documents of different sizes adhering to different systems -> Double-sided print)

The flow of document handling is schematically shown below.



F02-202-03a

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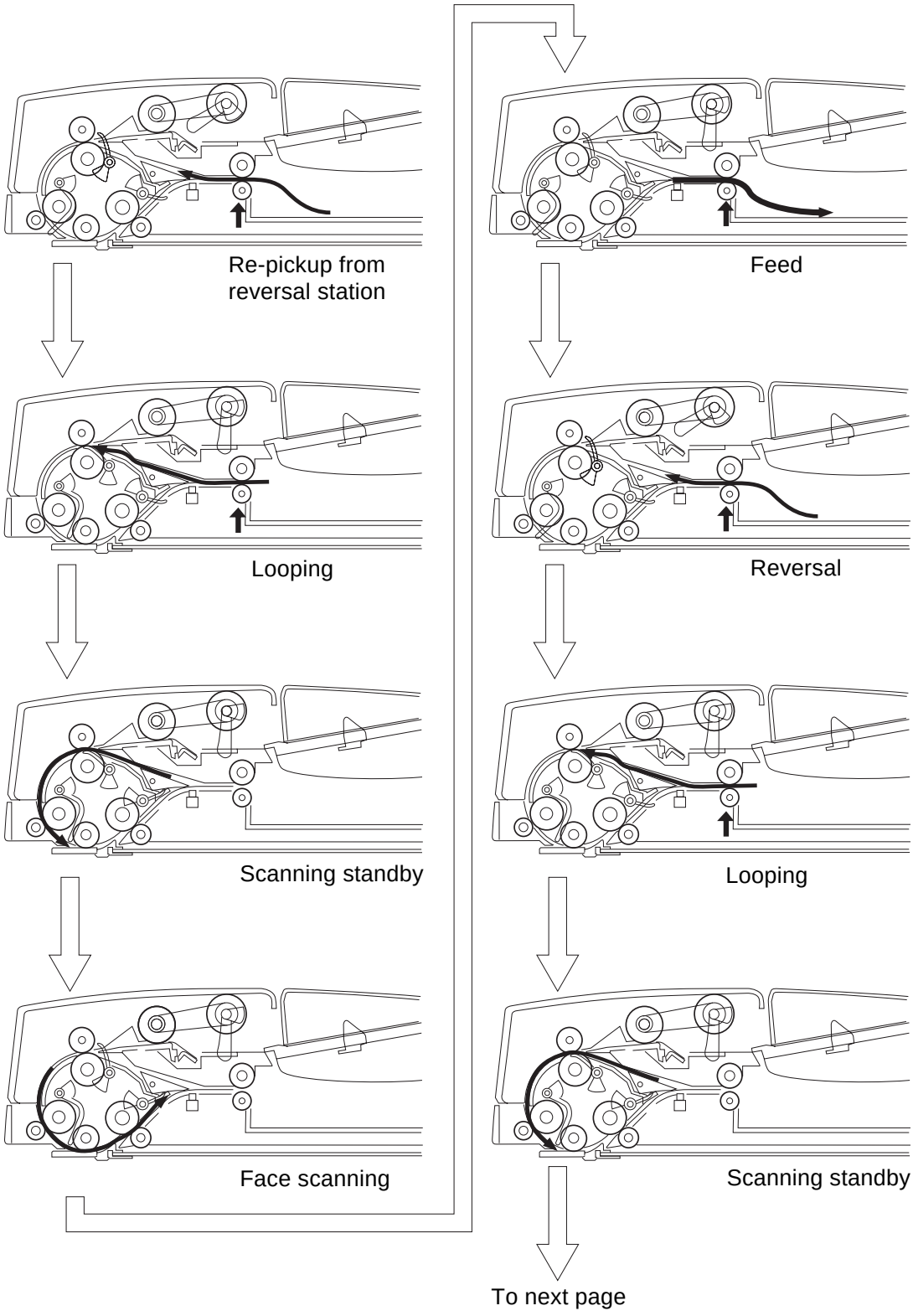
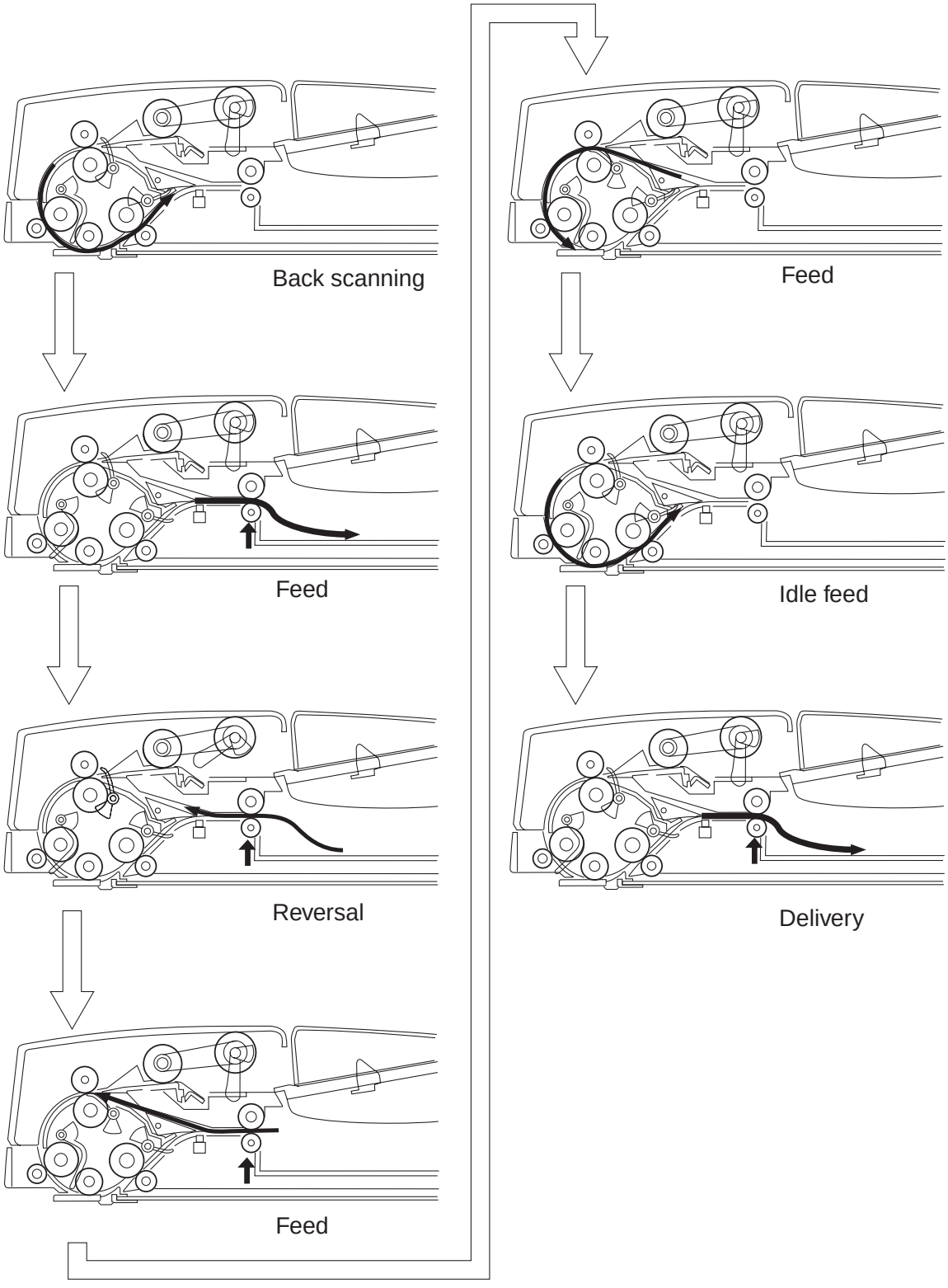

Re-pickup from reversal station
Looping
Scanning standby
Face scanning
Feed
Reversal
Looping
Scanning standby
To next page

F02-202-03b



F02-202-03c

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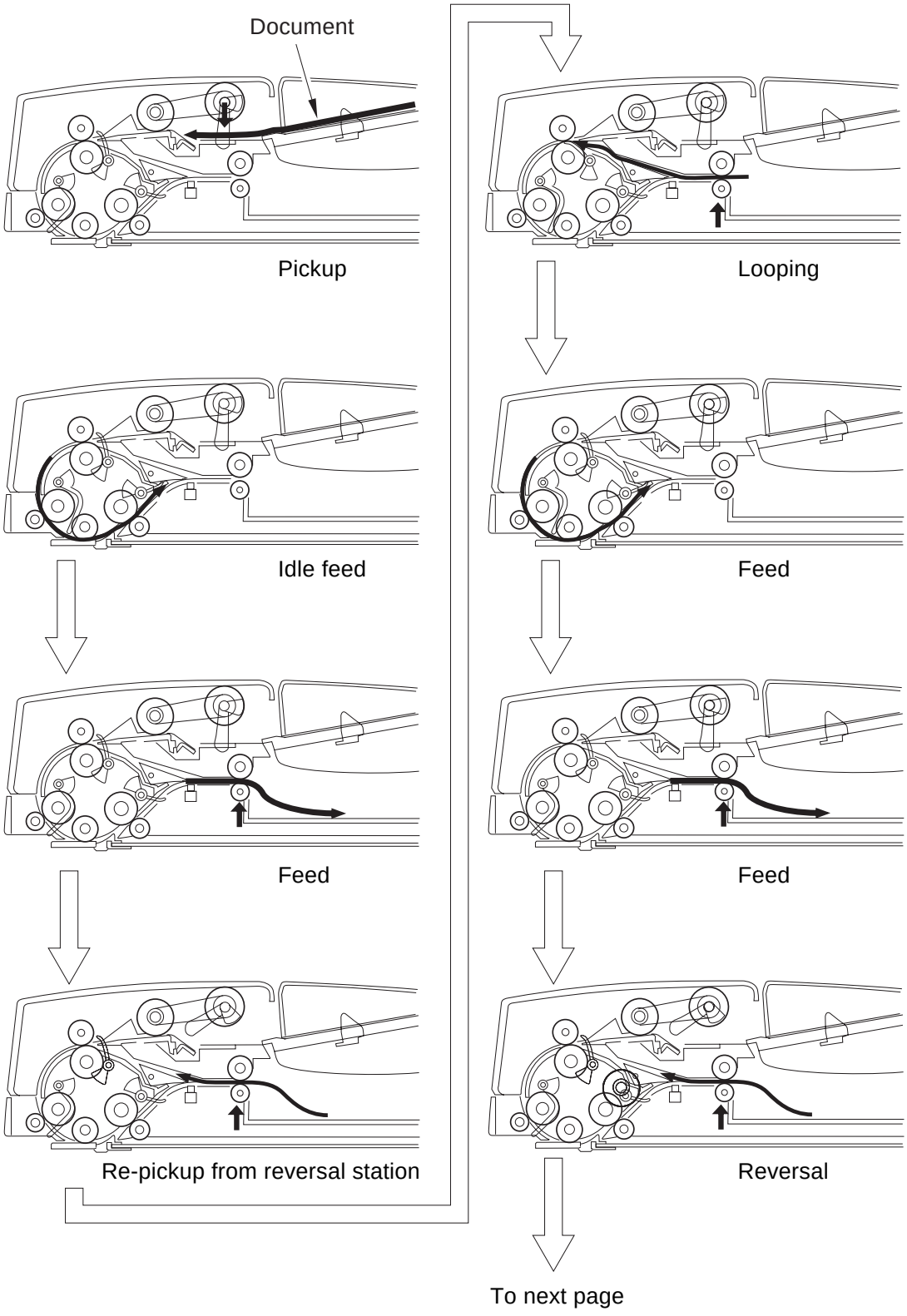
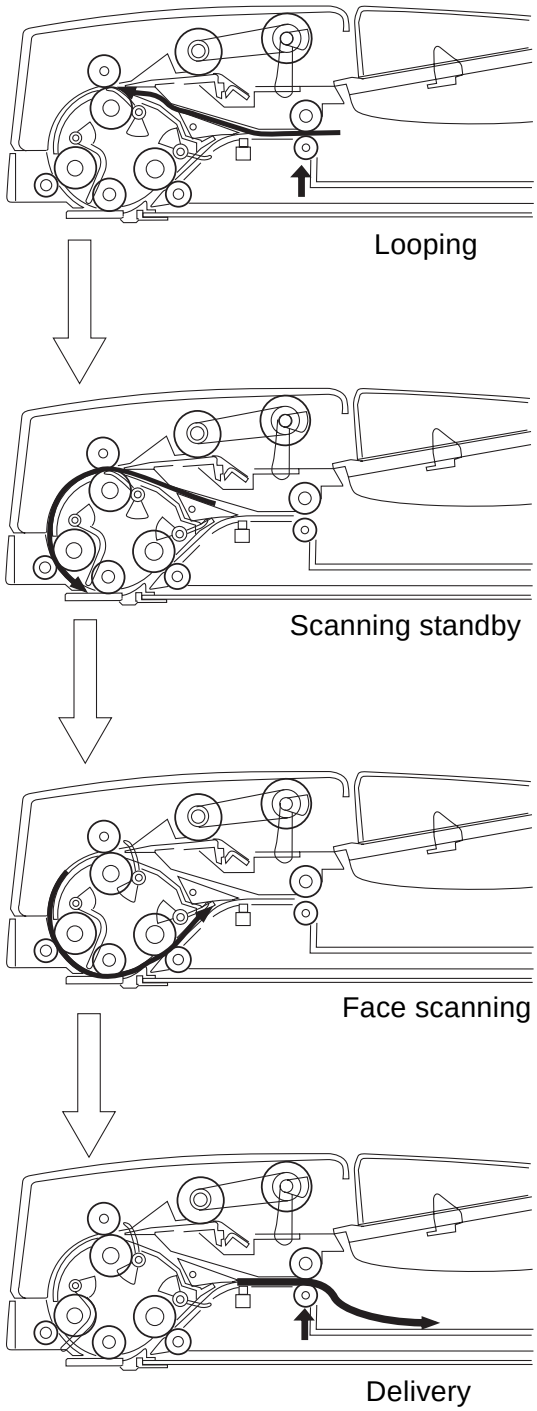
2.2.5 Idle feed/reversal pickup/delivery (Single-sided documents of different sizes adhering to different systems -> Single-sided print)

The flow of document handling is schematically shown below.



F02-202-04a



F02-202-04b

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2.3 Document Set Detection

2.3.1 Overview

This ADF detects whether a document is set or not in two ways, depending on the print mode.

- Normal printing (other than printing of documents of different sizes adhering to different systems and long-document mode)
- Printing of documents of different sizes adhering to different systems, long-document mode

a. Normal printing (other than printing of documents of different sizes adhering to different systems and long-document mode)

The following four document detection functions are operable during printing:

Function	Contents	Sensor (Symbol)
Document presence/ absence detection	Detecting the presence or absence of a document in the document pickup tray	Document set sensor (PI10)
Last document detection	Detecting whether the document being fed is the last document or not	End-of-document sensor (PI1)
Initial document size detection		Document length sensors 1/2 (PI3/PI4)
• Feed direction	Detecting the length of a document set in the document pickup tray Small and large size identification LTRR and LGL identification	
• Width direction	Detecting the width of a document set in the document pickup tray	Document width detection variable resistor (VR1) A4R/LTRR identification sensor (PI2)
Final document size detection • Feed direction	Detecting the length of a document in the feed path in the feed direction	Read sensor (PI7)

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b. Printing of documents of different sizes adhering to different systems/Long-document mode

The following three document detection functions are operable while printing documents of different sizes adhering to different systems:

Function	Contents	Sensor (Symbol)
Document presence/ absence detection	Detecting the presence or absence of a document in the document pickup tray	Document set sensor(PI1) End-of-document sensor (PI1)
Last document detection	Detecting whether the document being fed is the last document or not	Read sensor (PI7) Document width detection variable resistor (VR1)
Document length detection	Detecting a document length from the feed distance between read sensor (PI7) ON and OFF Document width detection is also used to identify A5R and A4.	

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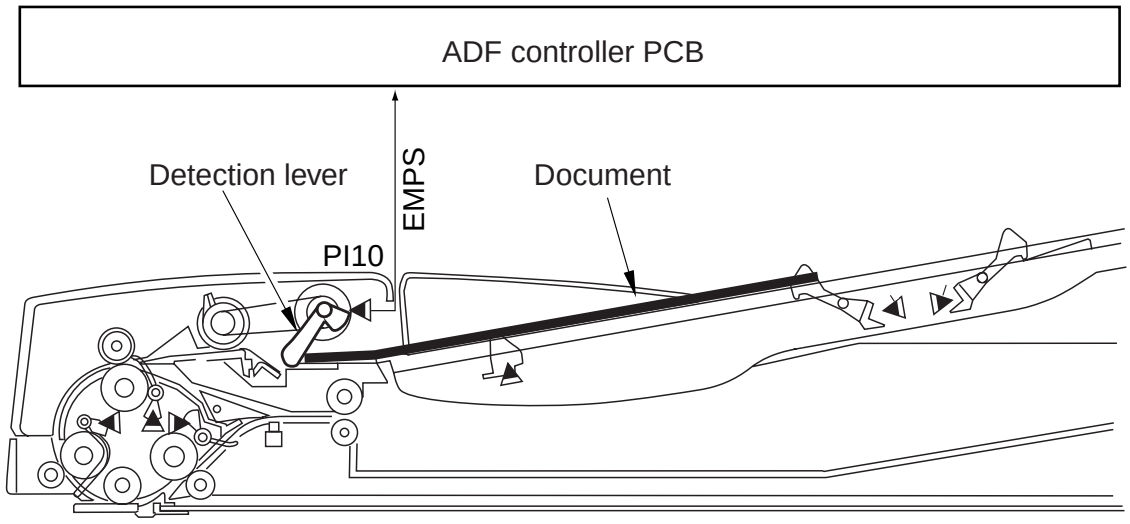
2.3.2 Detecting the presence or absence of a document in the document pickup tray

The document set sensor (PI10) detects the presence or absence of a document in the document pickup tray.

When a document is paced in the document tray, the detection lever works in synchronization with the shading plate to uncover the photointerrupter. This allows the document set sensor (PI10) to generate a document detection signal (EMPS) for transmission to the ADF controller PCB, which turns on the Document Set LED on receiving the EMPS signal.

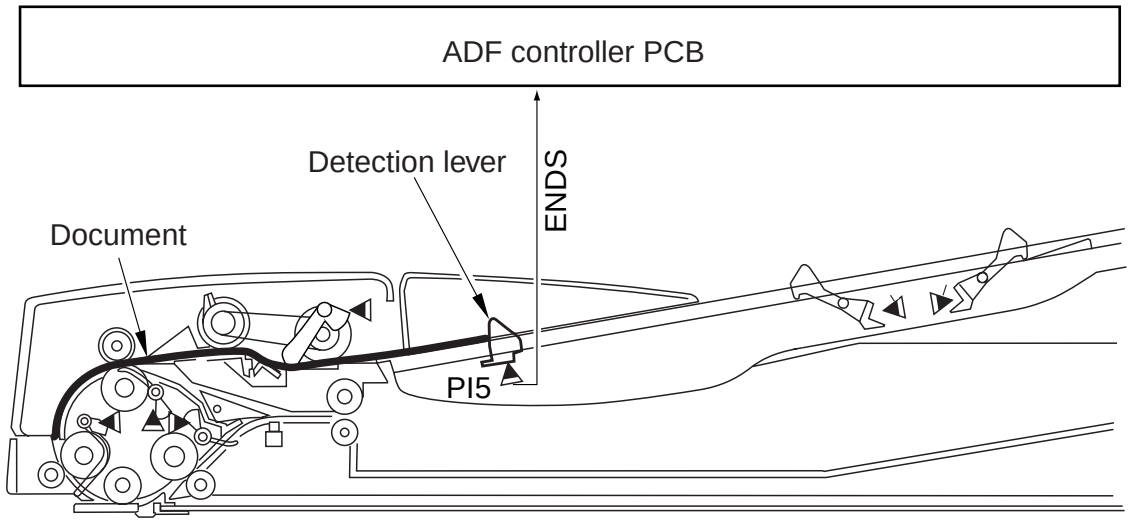
F02-203-01



2.3.3 Detecting whether the document being fed is the last document or not

The end-of-document sensor (PI5) detects whether the document being picked up is the last document in the document tray or not.

When the last document is picked up and the trailing sheet of the document passes the last document detection lever in the document tray, the detection lever works in synchronization with the shading plate to cover the photointerrupter. This allows the end-of-document sensor (PI5) to generate a last document detection signal (ENDS), notifying the host that the paper being picked up is the last document in the document tray.



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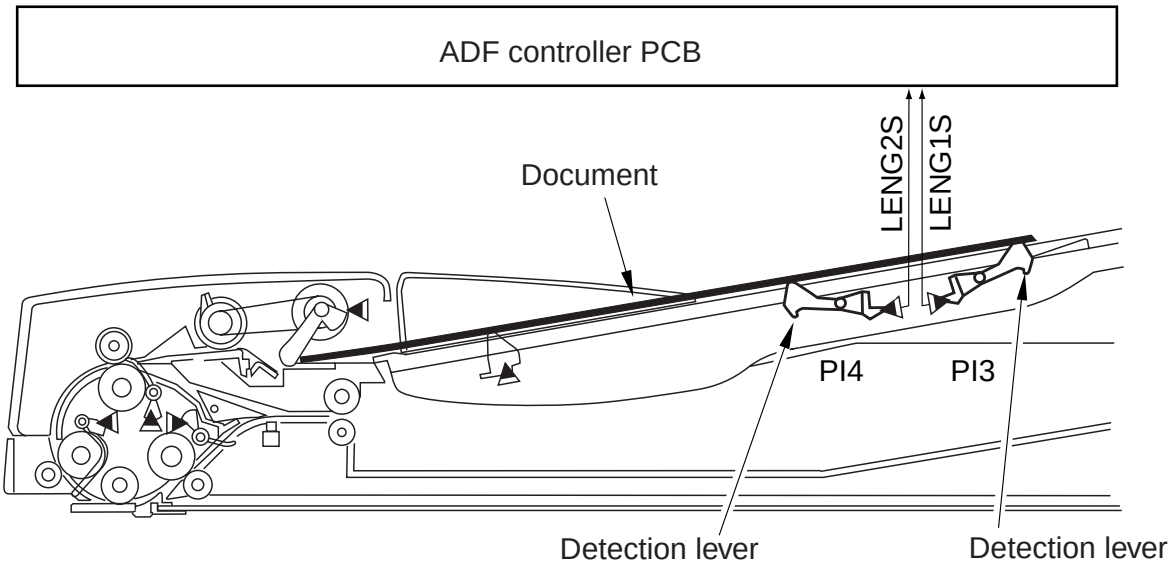
2.3.4 Initial document size detection (feed direction)

Initial document size detection (feed direction) uses document length sensor 1 (PI3) and document length sensor 2 (PI4) to detect the size in the feed direction of a document set in the document tray.

When a document is placed in the document tray, the detection levers in the two document length sensors work in synchronization with the shading plate to cover the photointerrupter. Document size information detected on the basis of the combination of the signals (LENG1S/LENG2S) from these two document length sensors is transmitted to the host.

Document size information is detected on a real-time basis and transmitted to the hosts at 10 msec intervals. T02-203-03 summarizes the relationships among each document length sensor signal, the document width, and the results of document size detection.



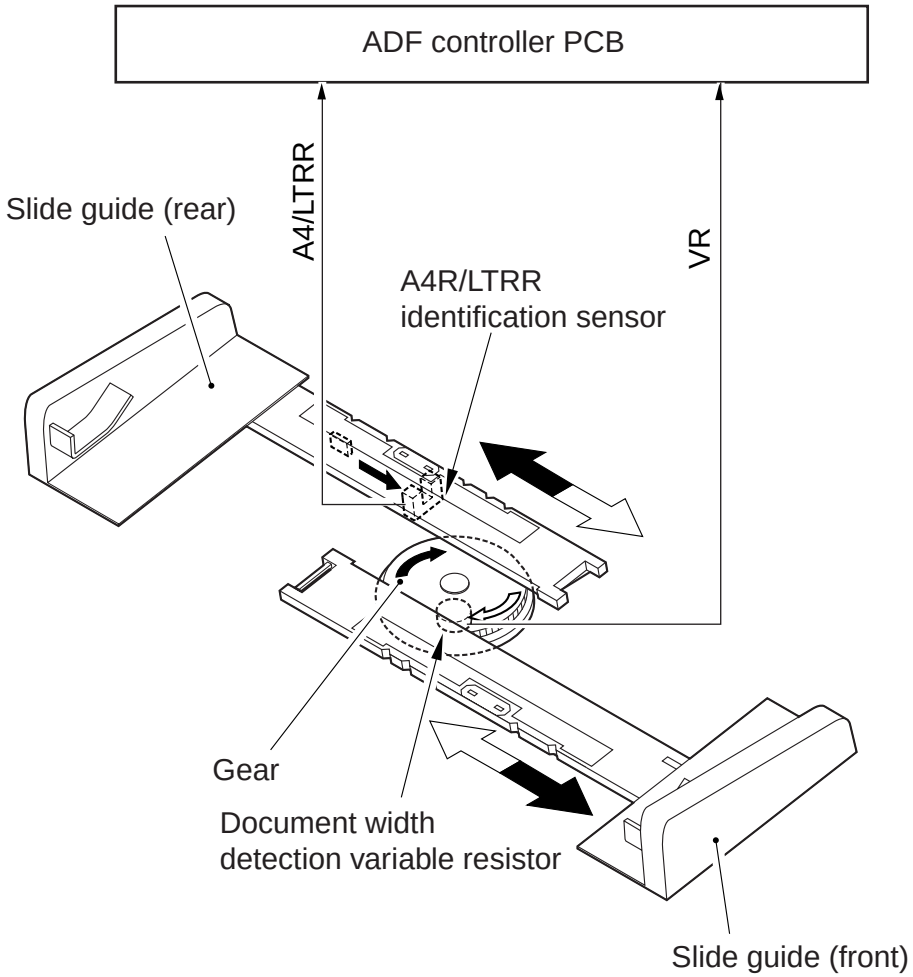
F02-203-02

2.3.5 Initial document size detection (width direction)

a. Overview

Initial document size detection (width direction) is accomplished by the document width detection variable resistor (VR1) in the document tray. The document width detection variable resistor works in synchronization with the slide guide to vary its resistance in an analog form. The ADF controller receives changes in this resistance as a document size signal (VR) and replaces it with a size in the width direction.

A dedicated A4R/LTRR identification sensor (PI2) in the document tray assures that document width detection variable resistor (VR1) is able to detect the widths of A4R (210 mm wide) and LTRR (216 mm wide) accurately. The A4R/LTRR identification sensor generates a 1 on the A4/LTRR identification on detecting a document width that is 197mm or more but less than 214mm.



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T02-203-04 summarizes the relationships among each document length sensor signal, the document width, and the results of initial document size detection.

*1: The ON area of the A4R/LTRR identification sensor is 197 mm or more but less than 214 mm.

Document width w (mm) (Document width detection variable resistor)	A4R/ LTRR*1 identification sensor	Tray sensor 1	Tray sensor 2	Detected size		
				Mixed	AB system	inch system
148 ≦ w < 171	–	OFF	OFF	A5R	A5R	
		ON	OFF			
		–	ON			
172 ≦ w < 199	–	OFF	OFF	B6	B6	
		ON	OFF	B5R	B5R	
		–	ON			
200 ≦ w < 246	ON	OFF	OFF	A5	A5	
		ON	OFF	A4R	A4R	
		–	ON			
	OFF	OFF	OFF	STMT		STMT
		ON	OFF	LTRR		LTRR
		–	ON	LGL		LGL
247 ≦ w < 268	–	OFF	OFF	B5	B5	
		ON	–			
		–	ON	B4		
269 ≦ w < 288	–	OFF	OFF	LTR	B4	LTR
		ON	–	11" x 17"		11" x 17"
		–	ON	11" x 17"		11" x 17"
289 ≦ w < 297	–	OFF	OFF	A4	A4	
		ON	–	A3	A3	
		–	ON	A3	A3	

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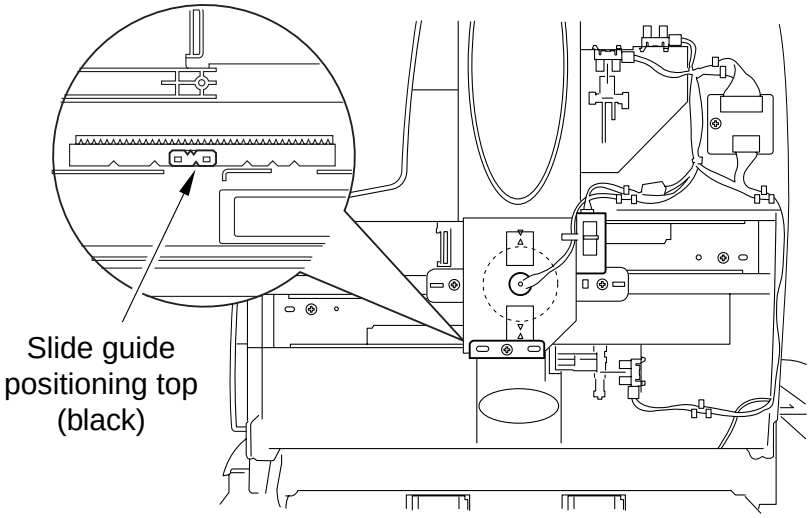
b. Slide guide positioning tops

The slide guide rail is grooved to allow the ADF to stop at given standard size positions. However, slide guide stop positions adjoining depending on the paper size may cause the ADF to stop at an incorrect position. This ADF provides two types of slide guide positioning tops to vary the slide guide stop position.

Slide guide Positioning top color and making	Slide guide stop position	
White/A and making (A/B system use)	Single-grooved side	Double-grooved side
Black/L and making (Inch system use)	A4R	A4R
		LTRR
	LTRR	A4R
		LTRR

T02-203-04



F02-203-04

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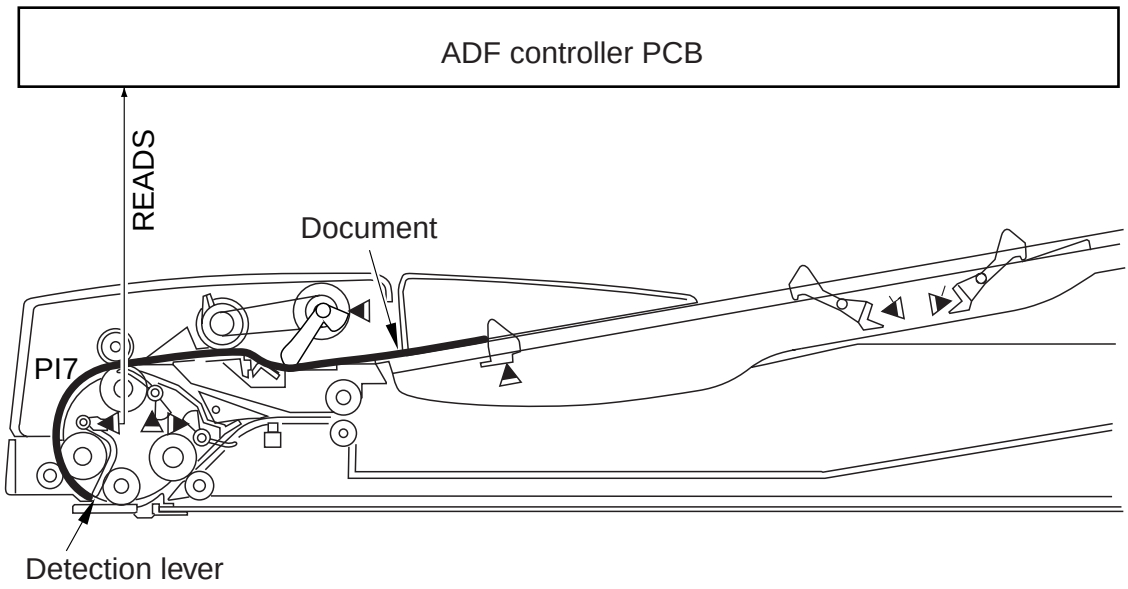
2.3.6 Final document size detection

Final document size detection is carried out on the basis of the document length calculated from the distance of the feed motor driven before a document passes the read sensor (PI7) and the value of initial document size detection calculated by the document width detection variable resistor (VR1).

When a document passes the document detection lever at the read sensor (PI7), the detection lever works in synchronization with the shading plate to cover the photointerrupter. The length of the feed distance is detected by counting the clock pulses generated by the feed motor (M2) between the two instants of read sensor (PI7) ON and read sensor (PI7)OFF.



F02-203-05

The table below lists the standard sizes that the ADF recognizes from detected sizes.

[Mixed loading of documents of different sizes adhering to the AB system]

Standard size	Document width w (mm)	Document length (mm)
B6		1 ≦ 140
A5		141 ≦ 1 < 165
B5		166 ≦ 1 < 196
A5R	W ≦ 199	197 ≦ 1 < 234
A4	W ≦ 200	197 ≦ 1 < 234
B5R		235 ≦ 1 < 277
A4R		278 ≦ 1 < 331
B4		332 ≦ 1 < 392
A3		393 ≦ 1

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[Mixed loading of documents of different sizes adhering to the inch system]

Standard size	Document width w (mm)	Document length (mm)
STMT		1 ≦ 178
LTR		179 ≦ 1 < 248
LTRR		249 ≦ 1 < 318
LGL		319 ≦ 1 < 394
11" x 17"		395 ≦ 1

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[Detecting standard sizes other than those in the mixed loading of different sizes of documents adhering to different systems]

Standard size			Document width w (mm)	Document length (mm)	A4R/LTRR identification sensor (PI2)
Mixed loading	AB system	Inch system			
A5R	A5R	STMT	171 ≦ w	1 ≦ 200	
B5R	B5R	LTRR		201 ≦ 1 < 300	
B4	B4	LGL		301 ≦ 1	
B6	B6	STMT	172 ≦ w < 199	1 ≦ 200	
B5R	B5R	LTRR		201 ≦ 1 < 300	
B4	B4	LGL		301 ≦ 1	
STMT	A5	STMT	200 ≦ w <246	1 ≦ 200	
LTRR	A4R	LTRR		201 ≦ 1 < 300	ON*1
LGL	B4	LGL		301 ≦ 1	
A5	A5	STMT		1 ≦ 200	
A4R	A4R	LTRR		201 ≦ 1 < 300	OFF
B4	B4	11" x 17"		301 ≦ 1	*1: The ON area of
B5	B5	LTR	247 ≦ w < 268	1 ≦ 250	the A4R/LTRR identi-
B4	B4	11" x 17"		251 ≦ 1	fication sensor (PI3) is
LTR	A4	LTR	269 ≦ w <288	1 ≦ 350	197 mm or more but
11" x 17"	A3	11" x 17"		351 ≦ 1	les t han214 mm of
A4	A4	LTR	w ≦ 289	1 ≦ 350	document width.
A3	A3	11" x 17"		351 ≦ 1	

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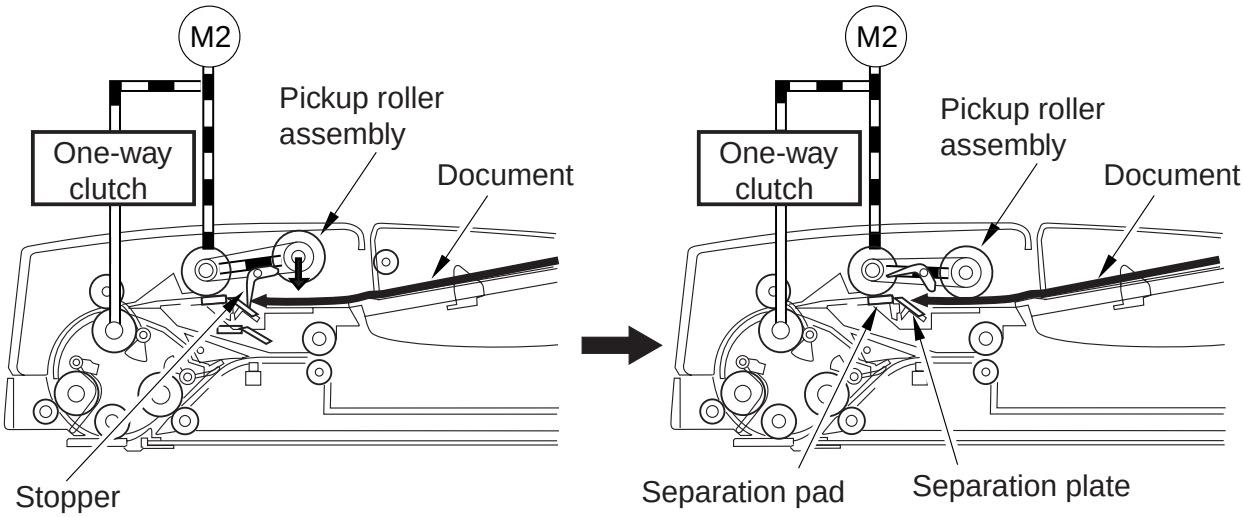
2.4 Document Pickup/Separation

2.4.1 Basic pickup operation

Pressing the PRINT START key with a document set in the document tray causes the ADF to pick up the document in the following sequence:

a. Pickup operation

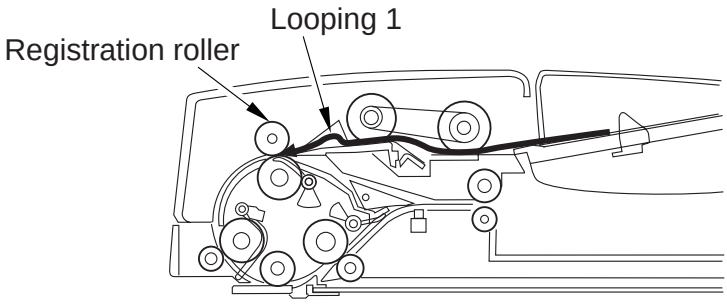
When the pickup motor (M2) reverses, the pickup roller assembly descends to rotate the pickup roller for feeding the document. The stopper ascends in synchronization with the pickup roller assembly. The separation plate and the separation pad prevent the document from feeding in duplicate as the document is fed.



F02-204-01

b. Looping

The pickup motor (M2) reverses, pressing the paper against the registration roller halted by the idling one-way clutch to form a loop, thereby preventing the document from skewing.



F02-204-02

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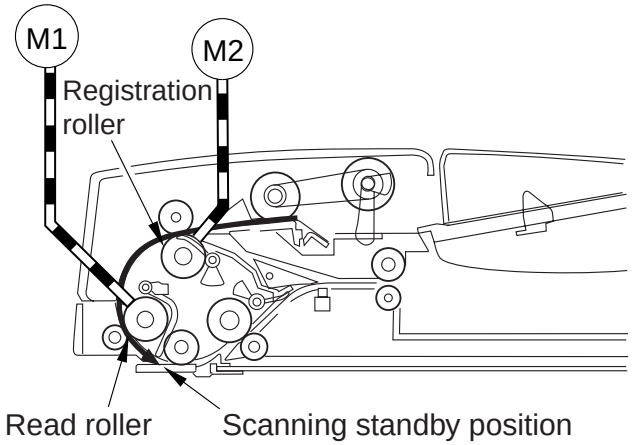
c. Feed

The pickup motor (M2) and the feed motor (M1) forward to cause the pickup roller assembly to ascend, with the registration roller and the read roller feeding the document to the scanning standby position. When the document reaches the scanning standby position, the pickup motor (M2) and the feed motor (M1) stop.

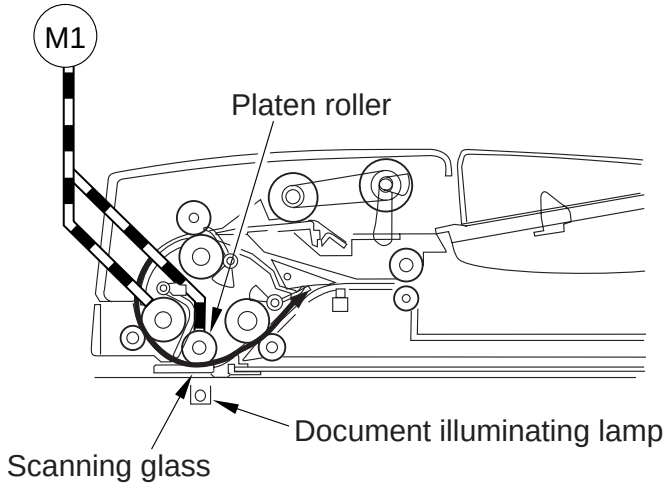


F02-204-03

d. Flow scanning

When the leading sheet of a document arrives at the scanning standby position, the ADF transmits an image start signal to the host to start flow scanning, in which the document scanned as it is moved over a sheet of glass in a stationary optic system in the host by a platen roller.

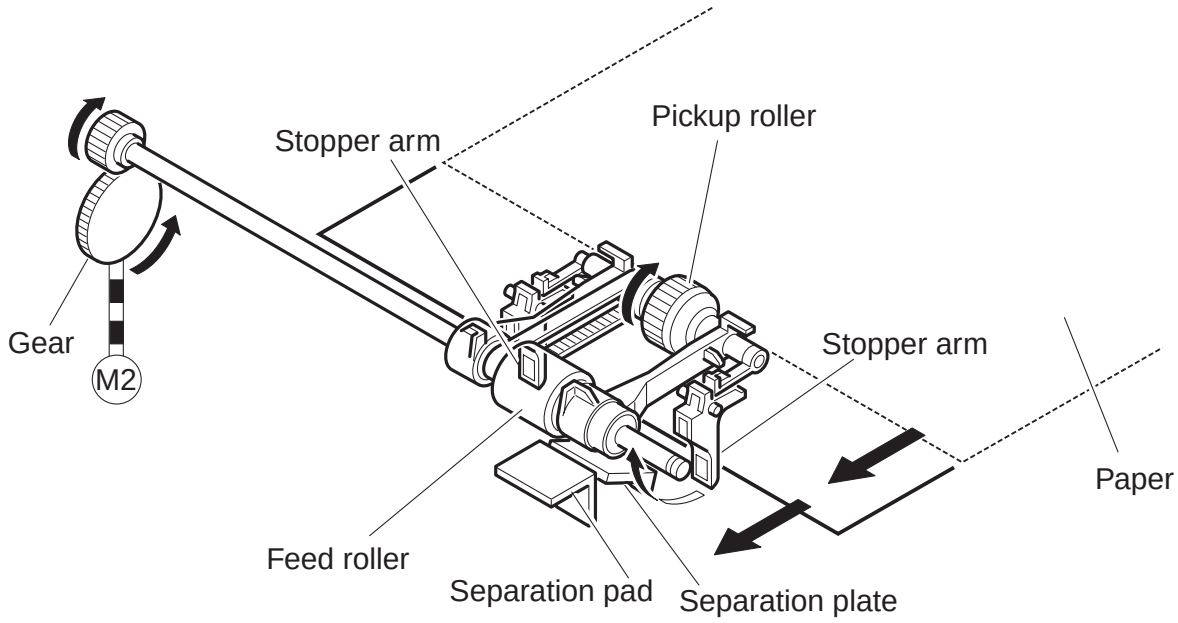
The scanned image is stored in the host's memory.



F02-204-04

2.4.2 Pickup station and stopper

The pickup station comprises a pickup roller and a separation roller. When the START key is pressed or a document pickup signal is entered, pickup motor (M2) reverses and the pickup station descends, allowing the pickup roller and the separation roller to turn to transfer the paper. The stopper ascends in synchronization with the pickup station. The separation plate and the separation pad prevent the document from feeding in duplicate during pickup. When the document is fed to reach the registration roller to form a loop, the pickup motor forwards and the pickup station ascends to transfer the document on the registration roller. The separation roller driving shaft that is driven by way of the spring one-way clutch is halted at the pickup station upper limit at this time, so that the built-in one-way clutch will rotate the separation roller through friction from the paper.



F02-204-05

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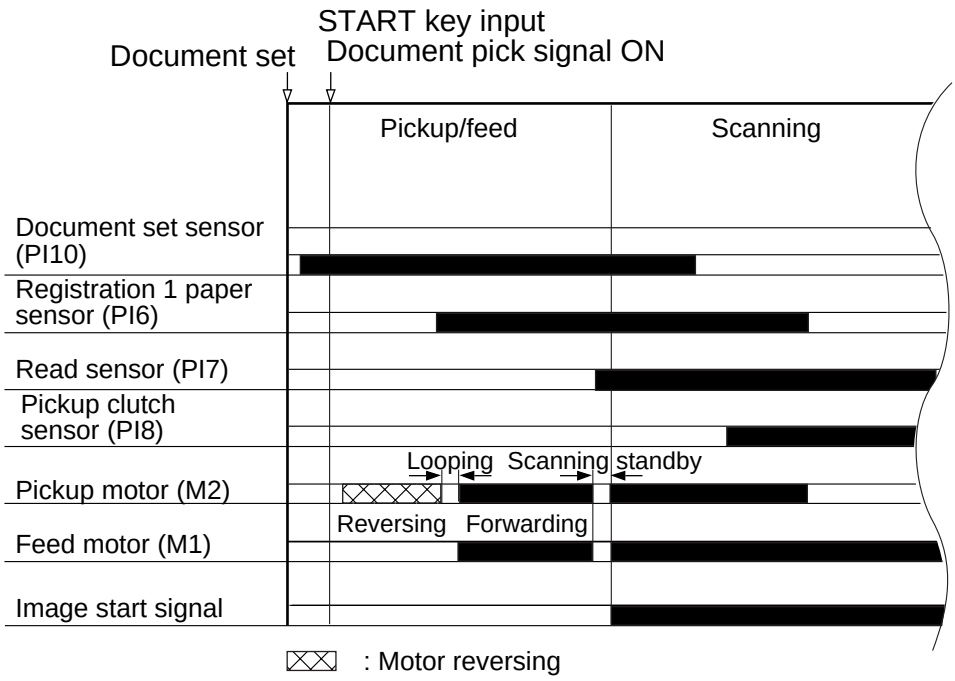
2.4.3 Pickup timing chart

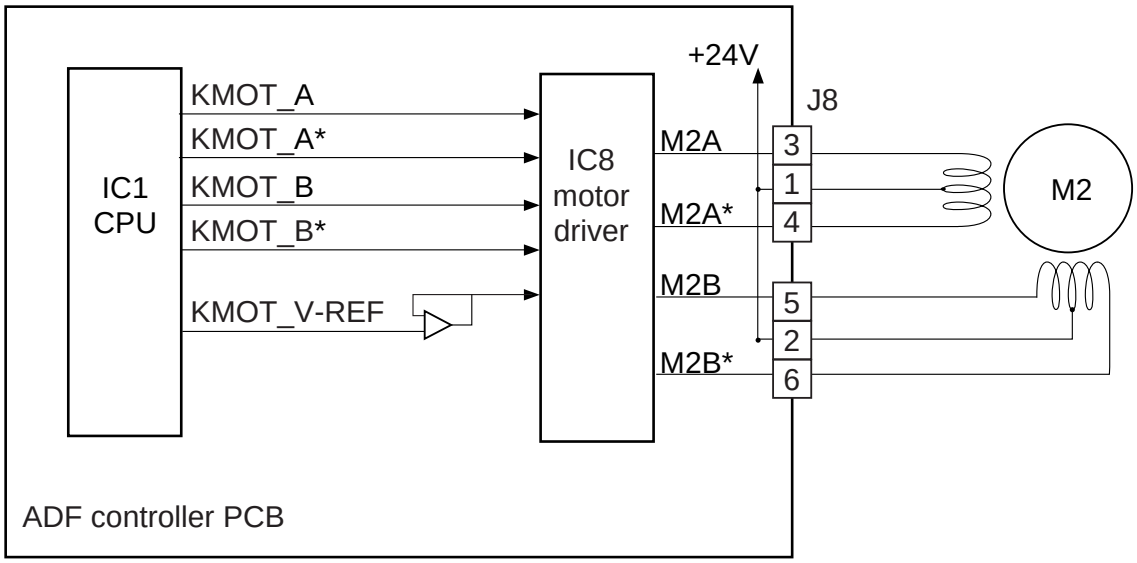


F02-204-06

2.4.4 Pickup motor (M2)control

A control block diagram of the pickup motor (M2) is shown below. The pickup motor is a four-phase stepping motor. This circuit mainly implements the following kinds of control:

- Motor ON/OFF control
- Motor revolution direction control
- Motor revolution speed control



F02-204-07

The CPU (IC1) mounted on the ADF controller PCB receives print mode communications data (such as scale, operation mode, and timing) from the host as commands. It generates driving pulses to the pickup motor on the basis of these commands.

As a stepping motor, the pickup motor has the direction and speed of its revolution controlled by varying the output order and frequencies of (M2A•M2A*•M2B•M2B*).

Signal name	Function
KMOT_A	Driving pulse A
KMOT_A*	Driving pulse A (opposite phase)
KMOT_B	Driving pulse B
KMOT_B*	Driving pulse B (opposite phase)
KMOT_V-REF	Reference current value setting

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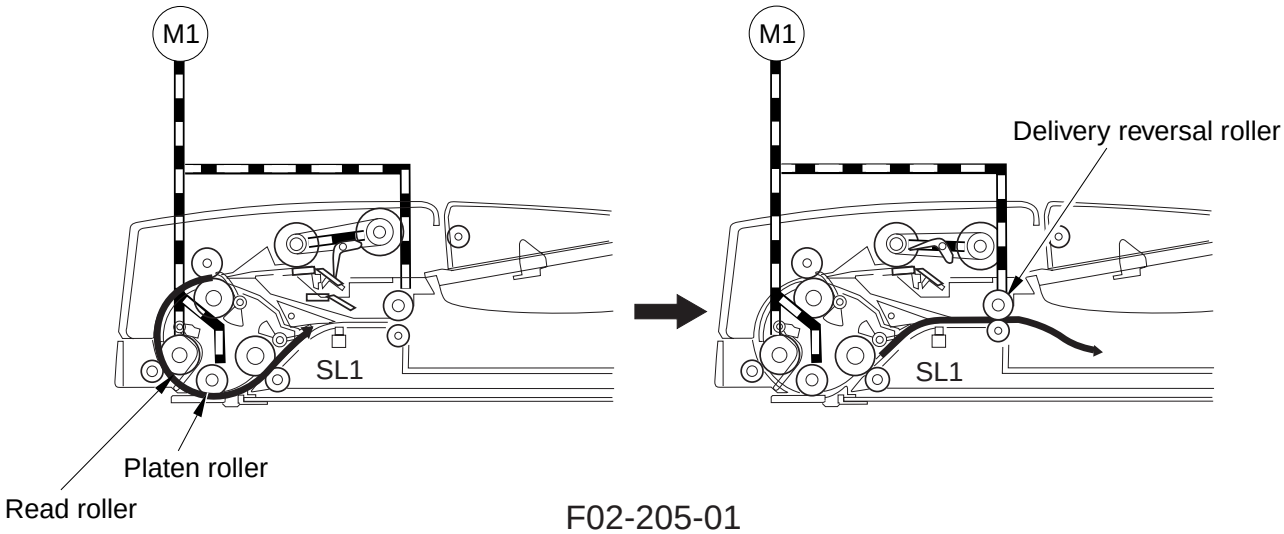
2.5 Reversing

2.5.1 Operation

The document reversal operation works in two modes: from the first side to the second side and from the second side to the first side. Since both modes are identical in terms of the document reversal process, the first to second side reversal operation is described below.

a. First-side pickup

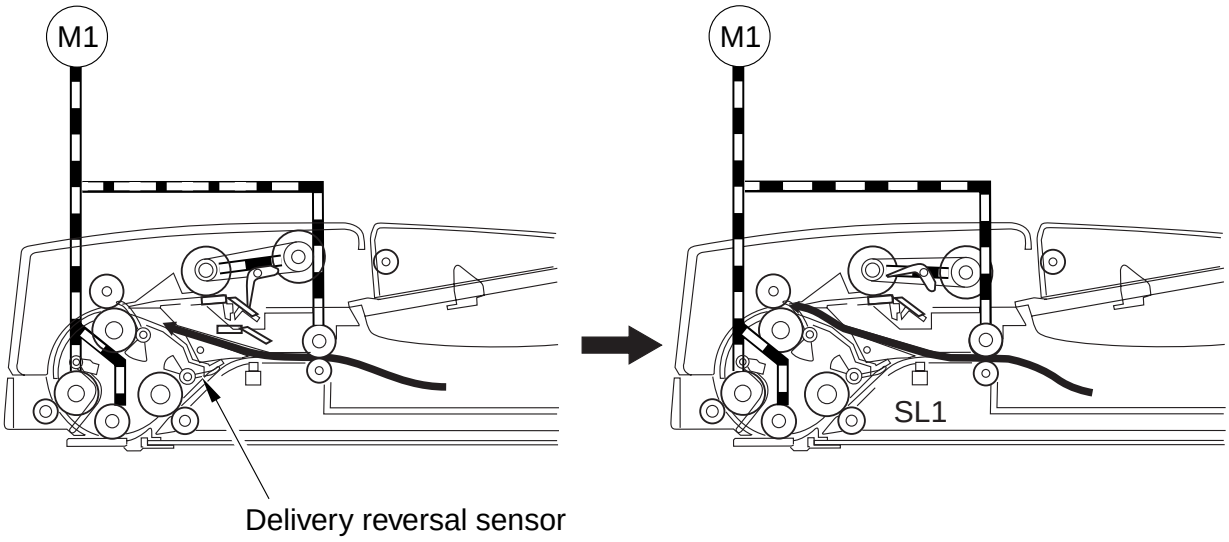
The feed motor (M1) drives the read roller and the platen roller to rotate for scanning the first side of the document. When the scan is completed, the locking solenoid (SL1) turns on as the image start signal turns ON, with the delivery reversal roller being locked to deliver the document to the delivery station.



F02-205-01

b. Reversal/feed 1

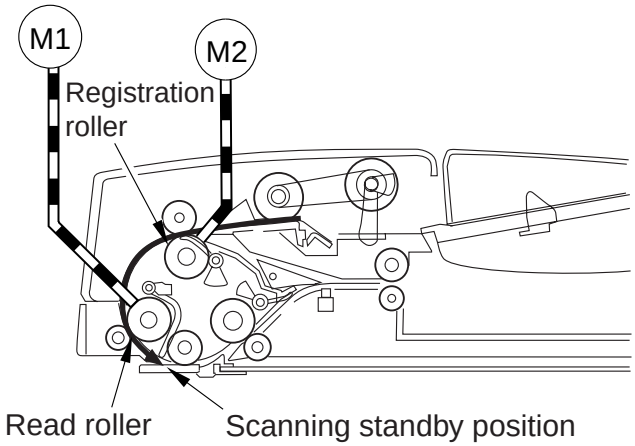
When the trailing sheet of the document fed passes the delivery reversal sensor (PI8), the feed motor (M1) stops. Then, the feed motor (M1) starts reversing immediately to feed the document to the registration roller position and then stops, thereby turning off the locking solenoid (SL1) to unlock the delivery reversal roller.



F02-205-02

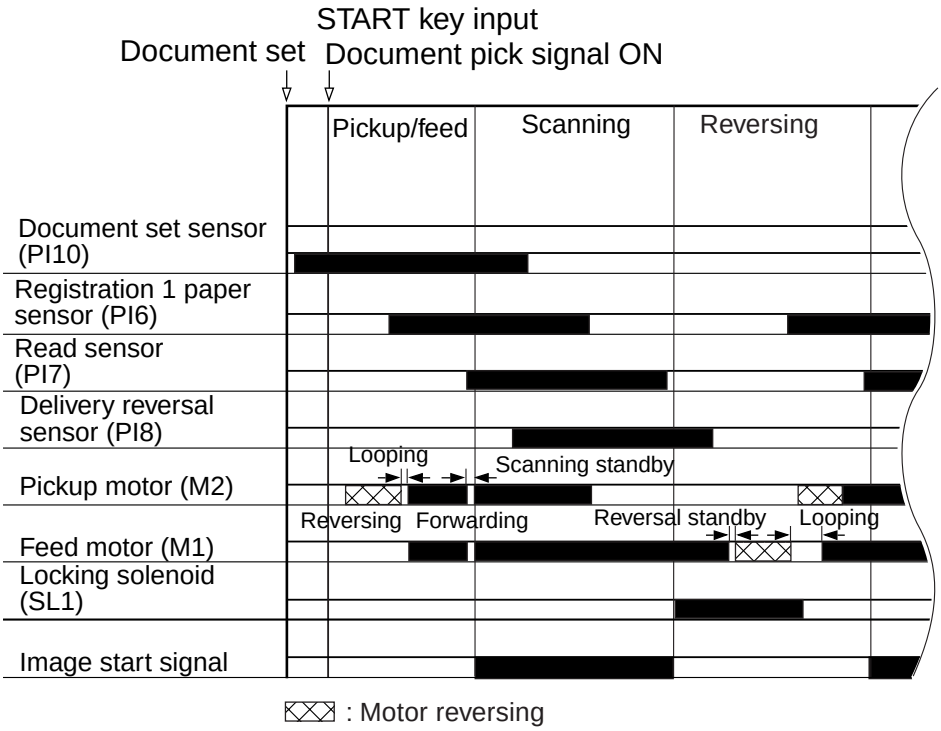
c. Reversal/feed 2

The feed motor (M1) rotates to feed the document to the scanning standby position and then stops. The document has been reversed by now.



F02-205-03

2.5.2 Operating sequences



F02-205-04

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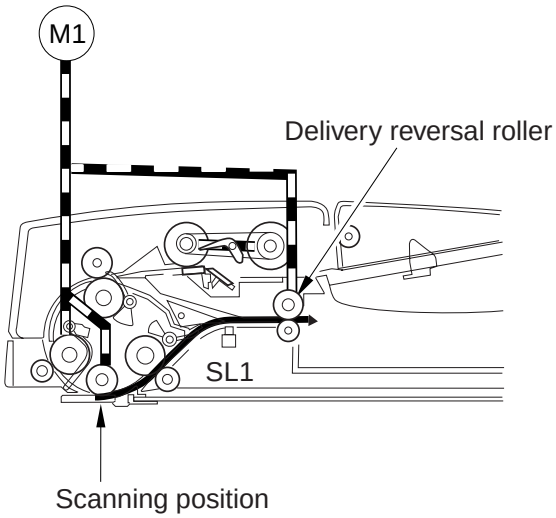
2.6 Document Feed/Delivery

2.6.1 Operation

When the flow scanning of a document is completed on the document table glass, it is delivered to the document delivery station in the following sequence of operations:

a. Document feed

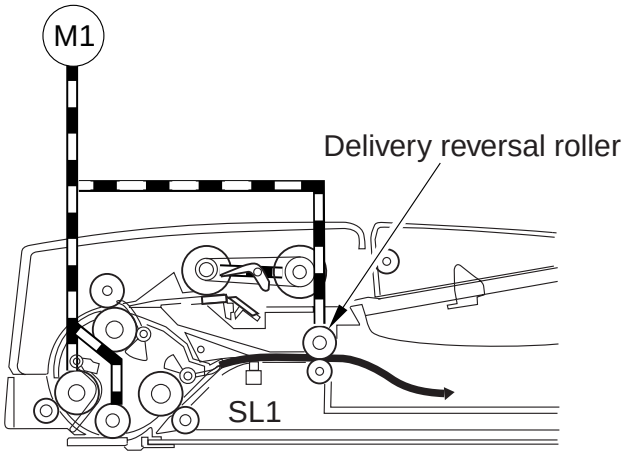
The locking solenoid (SL1) turns on, and the delivery reversal roller, lower is locked with the delivery reversal roller, upper. As the document passes the scanning position through the rotation of the separation roller, it is fed by the delivery reversal roller.



F02-206-01

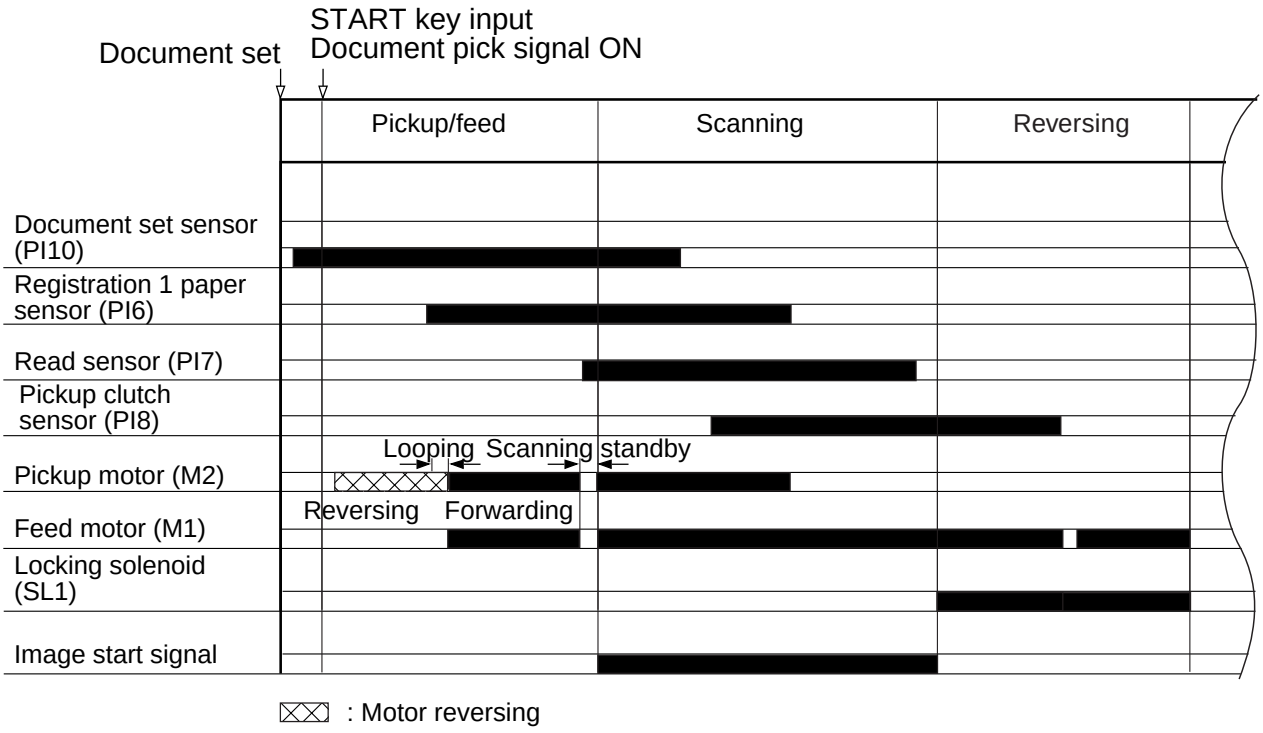
b. Delivery to the document delivery station

The document is delivered to the document delivery station by the delivery reversal roller rotating through the driving (forwarding) of the feed motor (M1).



F02-206-02

2.6.2 Operating sequence



F02-206-03

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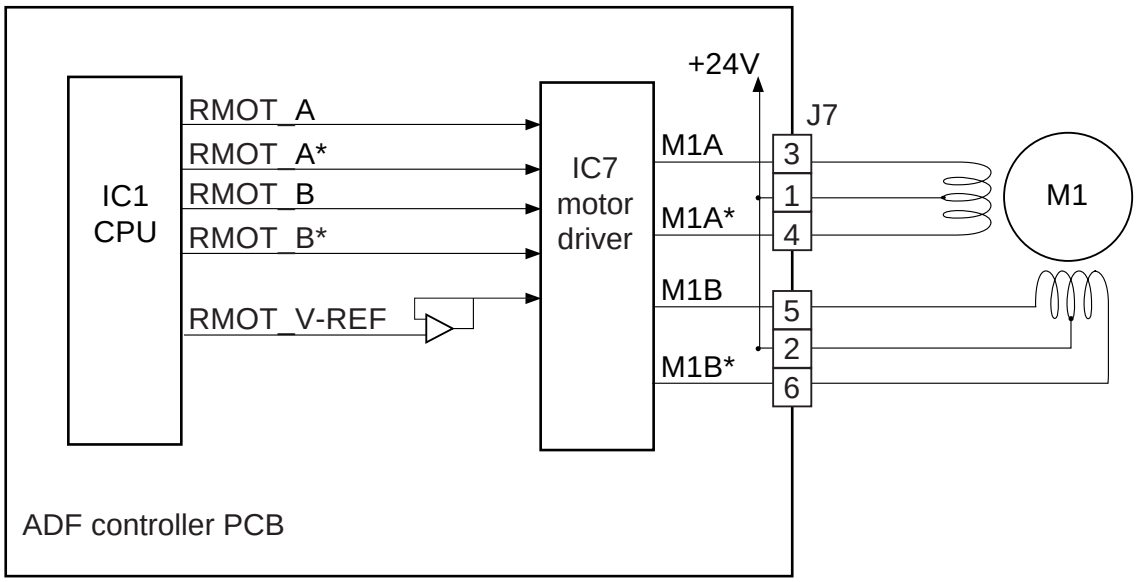
2.6.3 Feed motor (M1) control

A control block diagram of the feed motor (M1) is shown below. The feed motor (M1) is a four-phase stepping motor. This circuit mainly implements the following kinds of control:

- Motor ON/OFF control
- Motor revolution direction control
- Motor revolution speed control



F02-206-04

The CPU (IC1) mounted on the ADF controller PCB receives print mode communications data (such as scale, operation mode, and timing) from the host as commands. It generates driving pulses to the feed motor on the basis of these commands.

As a stepping motor, the feed motor has the direction and speed of its revolution controlled by varying the output order and frequencies of (M1A • M1A* • M1B • M1B*).

Signal name	Function
RMOT_A	Driving pulse A
RMOT_A*	Driving pulse A (opposite phase)
RMOT_B	Driving pulse B
RMOT_B*	Driving pulse B (opposite phase)
RMOT_V-REF	Reference current value setting

T02-206-01

3. Jams

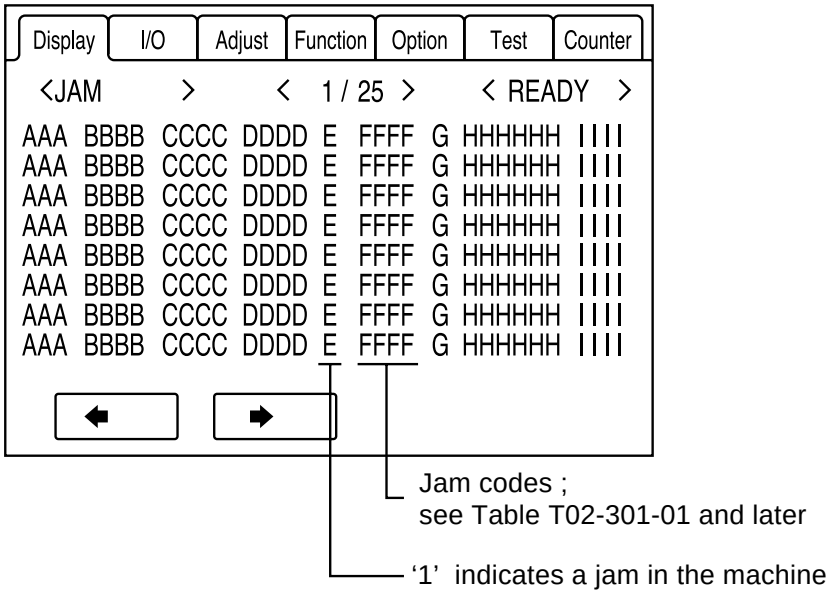
This ADF uses the sensors shown in F02-301-03 to detect document jams. The timing at which document jam checks are made is stored in ROM on the ADF controller PCB. The occurrence of a jammed document at a particular sensor is established on the basis of whether the document is located at that sensor.

When the ADF encounters a jam, it transmits coded information about the jam to the host.

This ADF displays jam codes in two ways:

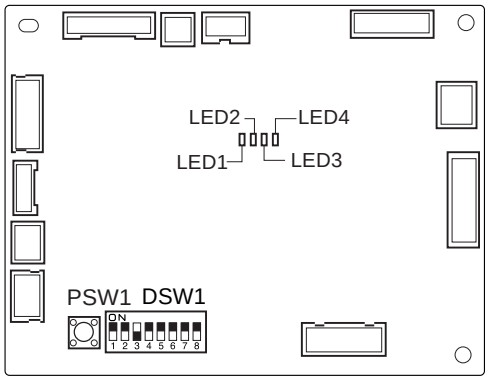
- Service mode screen on the host
- LED indications on the ADF controller PCB

Service mode screen on the host



F02-301-01

LED indications on the ADF controller PCB



F02-301-02

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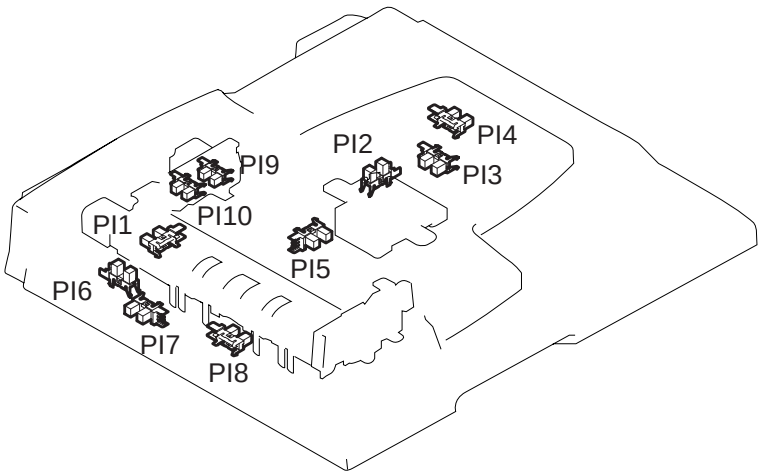

F02-301-03

The table below summarizes the jam codes, LED displays, jam types, associated sensors, and detection conditions.

● : OFF ◎ : Flashing (at 160 msec intervals)

Jam code	LED display	Jam type	Associated sensor	Detection condition
00x1	1 2 3 4 ●●●◎	Failure to reach registration roller paper sensor	PI6	A document has not been detected by the registration roller paper sensor (PI6) within 1.5 seconds after the start of separation.
00x2	1 2 3 4 ●●◎●	Registration roller paper sensor stack	PI6	The trailing sheet of a document has not been detected after the paper has been fed for a predetermined period of time upon detection by the registration roller paper sensor (PI6).
00x3	1 2 3 4 ●●◎◎	Failure to reach read sensor	PI6, PI7	A document has not been detected by the read sensor (PI7) after the paper has been fed for a predetermined period of time upon detection by the registration roller paper sensor (PI6).
00x4	1 2 3 4 ●◎●●	Read sensor stack	PI7	The trailing sheet of a document has not been detected after the paper has been fed for a predetermined period of time upon detection by the read sensor (PI7).
00x5	1 2 3 4 ●◎●◎	Failure to reach delivery reversal sensor	PI7, PI8	Paper has not been detected by the delivery reversal sensor (PI8) after the paper has been fed for a predetermined period of time upon detection by the read sensor (PI7).

T02-301-01

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● : OFF ◎ : Flashing (at 160 msec intervals)

Jam code	LED display	Jam type	Associated sensor	Detection condition
00x6	1 2 3 4 ●◎◎●	Delivery reversal sensor stack	PI8	The trailing sheet of a document has not been detected after the paper has been fed for a predetermined period of time upon detection by the delivery reversal sensor (PI8).
00x7	1 2 3 4 ●◎◎◎	ADF open	PI1	The ADF was opened during an operation (drive operation).
00x8	1 2 3 4 ◎●●●	User ADF open	PI1	The ADF was opened during an operation (drive outage).
00x9	1 2 3 4 ◎●●◎	ADF cover open	PI9	The ADF was opend during an operation (drive operation)
00xA	1 2 3 4 ◎●◎●	User ADF cover open	PI9	The feeder cover was opened during an operation (drive outage).
00xB	1 2 3 4 ◎●◎◎	Initial stack	PI6,PI7,PI8	Paper was detected in the path while picking up the first sheet of a document.
00xC	1 2 3 4 ◎◎●●	Pickup failure	PI10	A pickup signal was received for 2 seconds without a document in the document pickup tray.

T02-301-02

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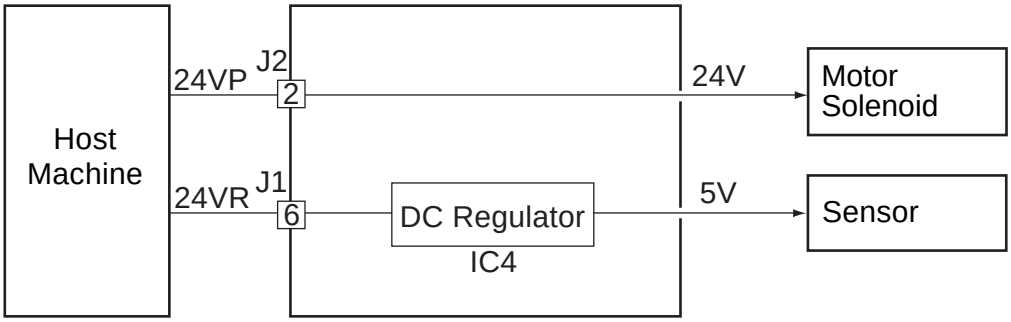
4. Power Supply

A block diagram of the power supply is shown below.

This ADF receives two sources of 24V (24VP, 24VR) from the host.

24VR is converted to 5V by IC4 before it is made available for driving the sensors and the ADF controller PCB.



F02-401-01

CHAPTER 3

MECHANICAL SYSTEMS

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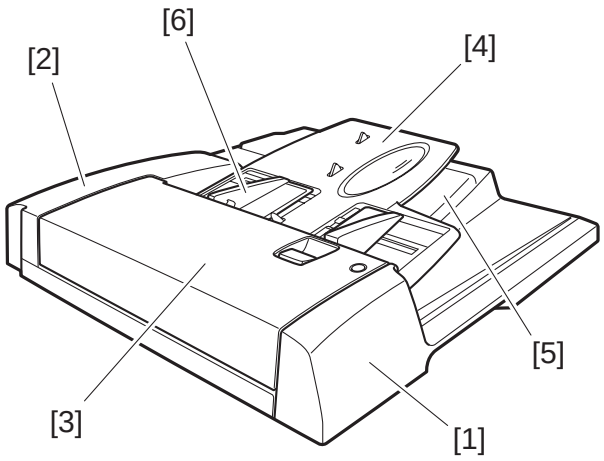
1. Basic Arrangement

1.1 Exterior Covers

[1] Front cover
[2] Rear cover
[3] Feeder cover
[4] Document pickup tray
[5] Document delivery station
[6] Slide guide

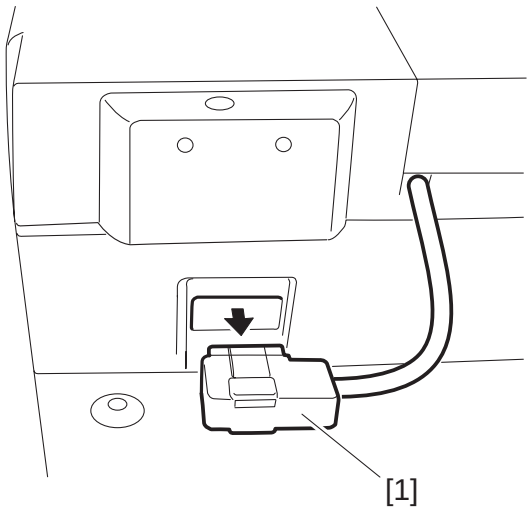


F03-101-01

When cleaning, inspecting and repairing the interiors of the mechanism, detach the covers by following these steps:

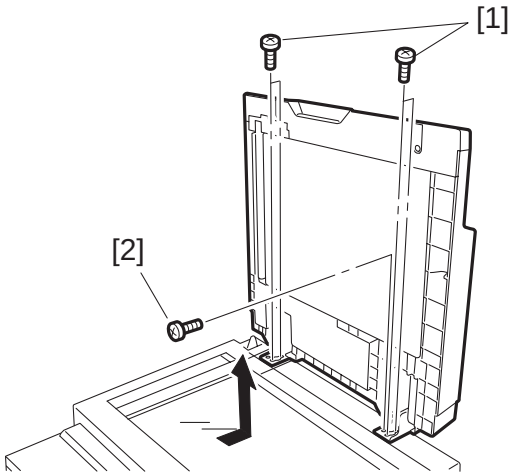
1.1.1 Removing the ADF

1) Turn off the power to the host.
2) Disconnect communication cable [1] for this ADF from the host.



F03-101-02

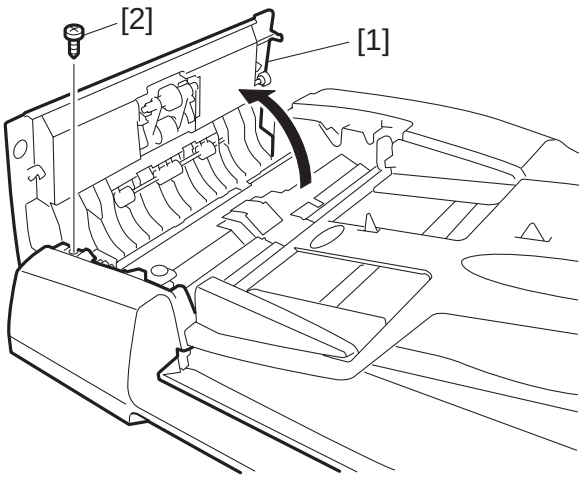
3) Remove two stepped screws [1] and [2].
4) Slide the ADF rearwards and then lift it off.



F03-101-03

1.1.2 Detaching the front cover

1) Opening feeder cover [1], remove screw [2].



F03-101-04

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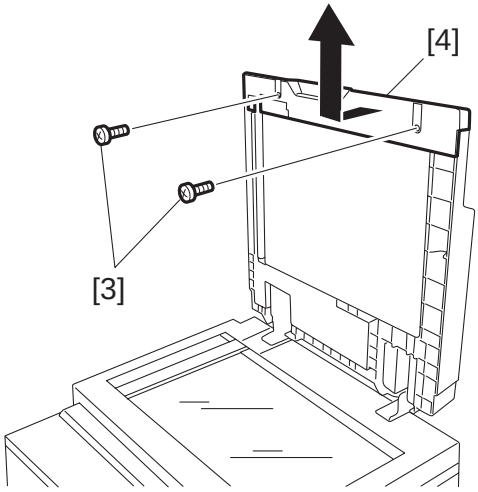
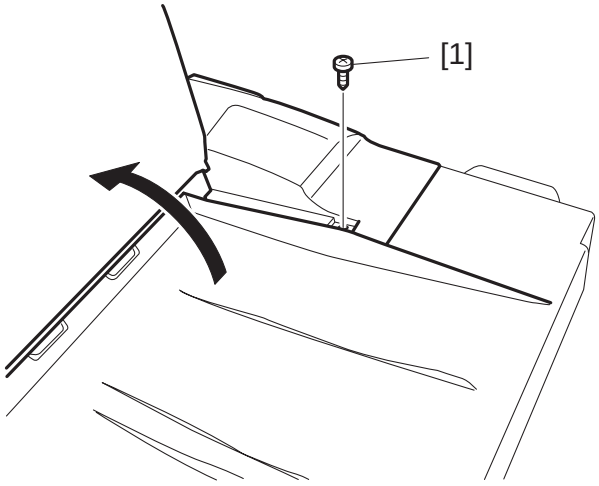
2) Remove two screws [3] to detach front cover [4] as illustrated.



F03-101-05

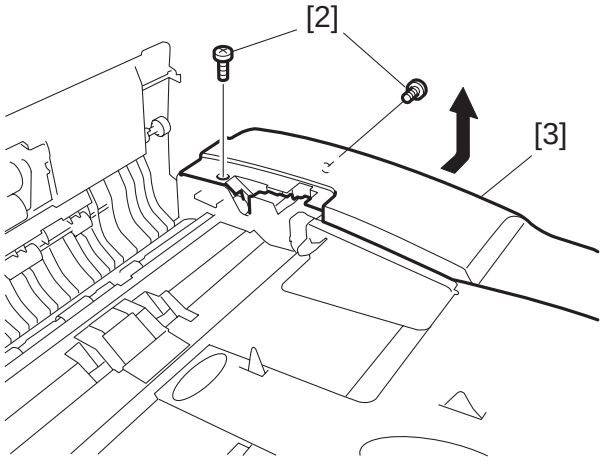
1.1.3 Detaching the rear cover

1) Opening the feeder cover, then the document pickup tray, remove screw [1].



F03-101-06

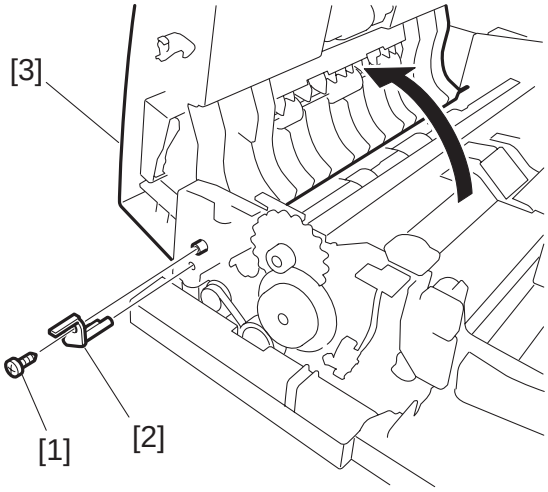
2) Opening the feeder cover, remove two screws [2] to detach rear cover [3].



F03-101-07

1.1.4 Detaching the feeder cover

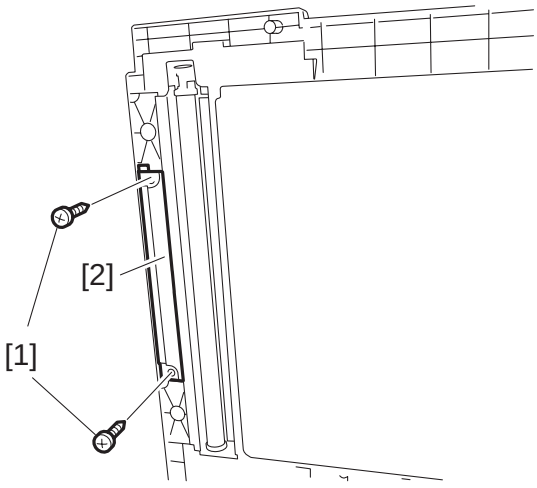
1) Detach the front cover.
2) Remove screw [1] and positioning pin [2] to detach feeder cover [3].



F03-101-08

1.1.5 Removing the feed roller guide

1) Open the ADF.
2) Remove two screws [1] to release feed roller guide [2].



F03-101-09

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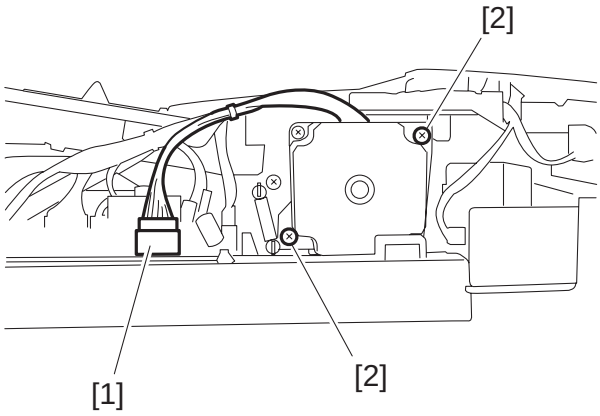
2 Drive Mechanism

2.1 Pickup Motor

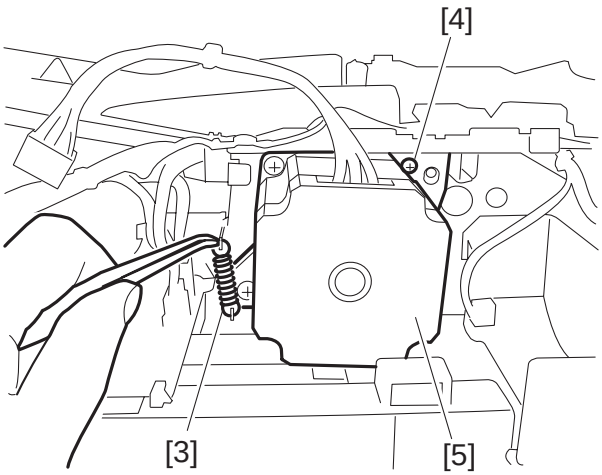
2.1.1 Releasing the pickup motor

1) Detach the rear cover.
2) Remove connector [1].
3) Remove two adjustment plate mounting screws [2].



F03-201-01

4) Detach tension spring [3] by using tweezers or a similar tool and remove stepped screw [4] to release pickup motor [5]with the adjustment plate.



F03-201-02

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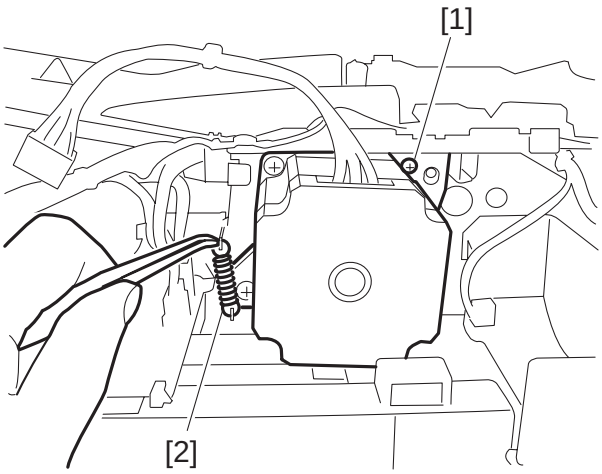
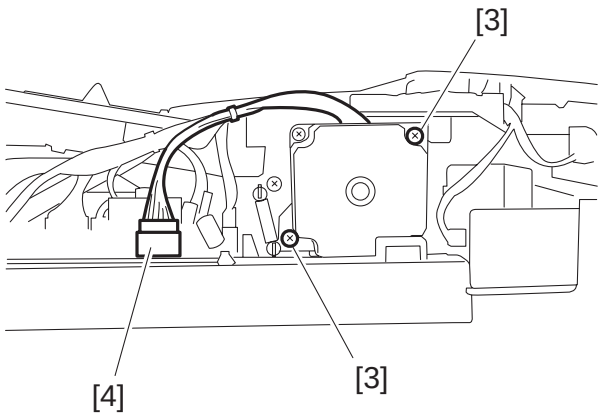
2.1.2 Mounting the pickup motor

1) Mount the motor with the timing belt engaged with the motor pulley, and tighten screw [1].
2) Attach tension spring [2] to the adjustment plate and the motor mounting plate.



F03-201-03

3) After securing the adjustment plate with two mounting screws [3], attach connector [4] to it.



F03-201-04

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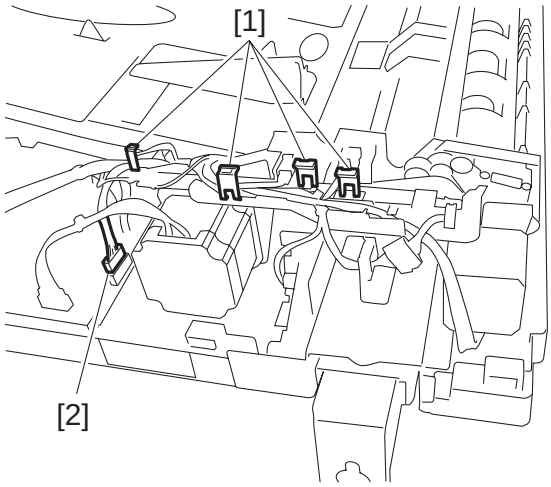
2.2 Feed Motor

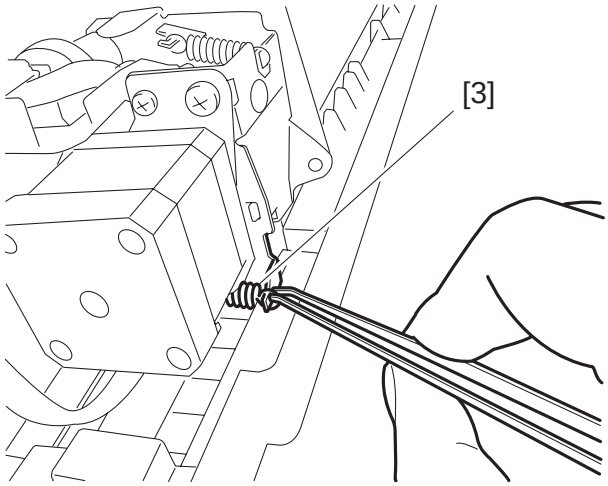
2.2.1 Releasing the feed motor

1) Detach the rear cover.
2) Release harness guide from four claws [1] to remove connector [2].



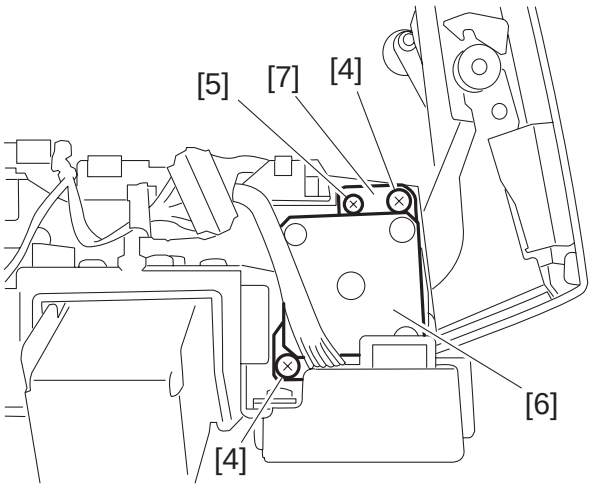
F03-201-05

3) Detach tension spring [3].



F03-201-06

4) Remove two screws [4] and stepped screw [5] to release feed motor [6] together with adjustment plate [7].



F03-201-07

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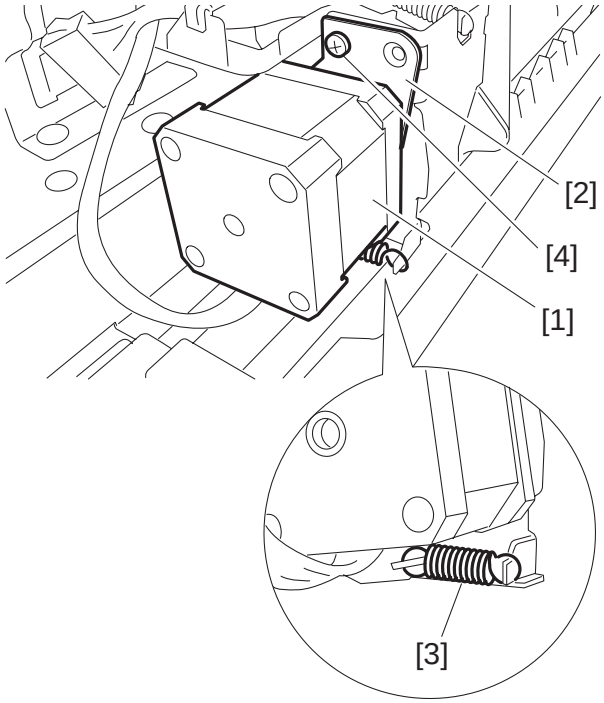
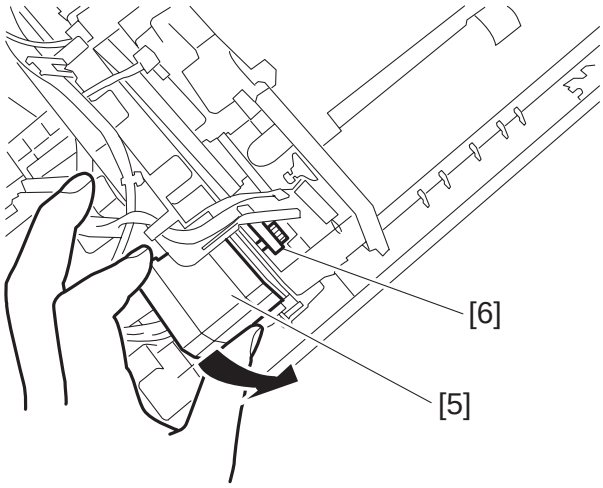
2.2.2 Mounting the feed motor

1) Mount feed motor [1] together with adjustment plate [2] and attach tension spring [3] and stepped screw [4].
Have the tension spring hooked to the adjustment plate to ease the work of attaching it at a later time.



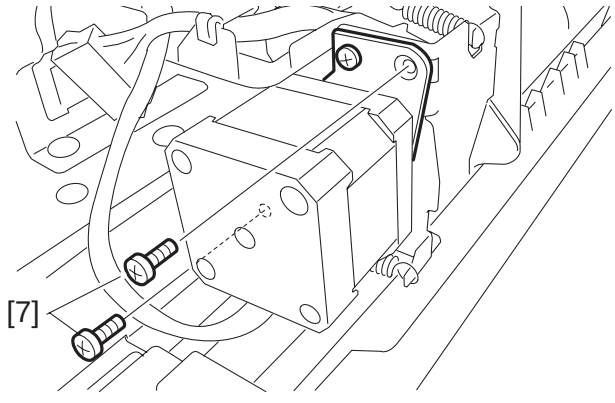
F03-201-08

2) With feed motor [5] pressed against the left end, attach timing belt [6] to the pulley.



F03-201-09

3) Secure the adjustment plate with two mounting screws [7].



F03-201-10

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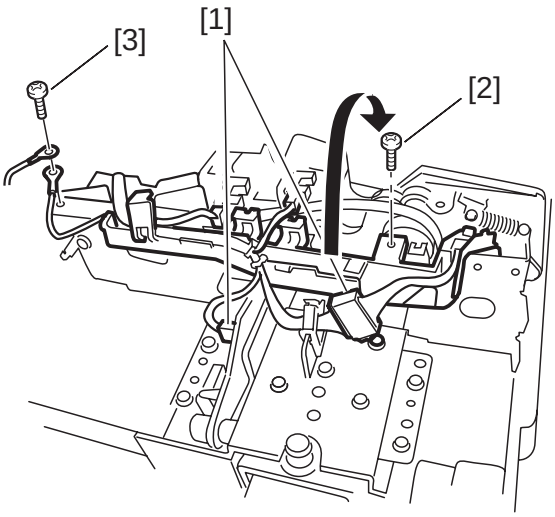
2.2.3 Disassembling the drive mechanism

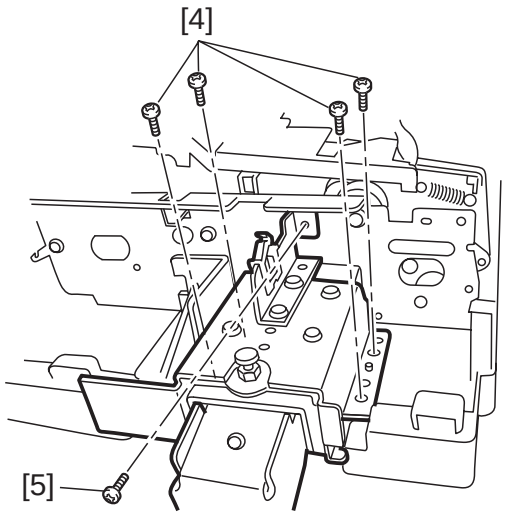
When replacing the drive timing belt and pulley, disassemble the drive mechanism by following these steps:

1) Detach the rear cover, front cover, and feeder cover.
2) Release the pickup motor and feed motor. (See P.3-5 to 3-7.)
3) After removing four connectors [1], screw [2], and ground mounting screw [3], slide the harness guide slightly to left and then lift it.



F03-201-11

4) Remove four screws [4] and screw [5] to release the left hinge assembly.



F03-201-12

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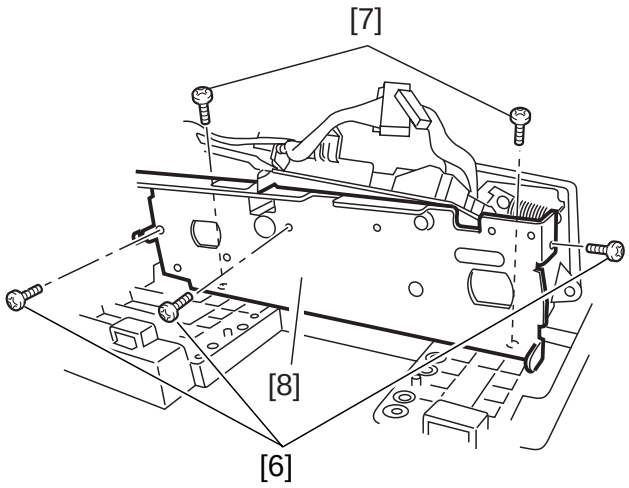
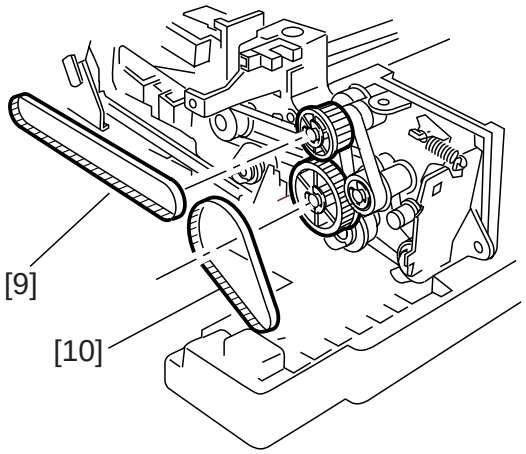
5) Remove three screws [6] and two screws [7] to release motor mounting plate [8].



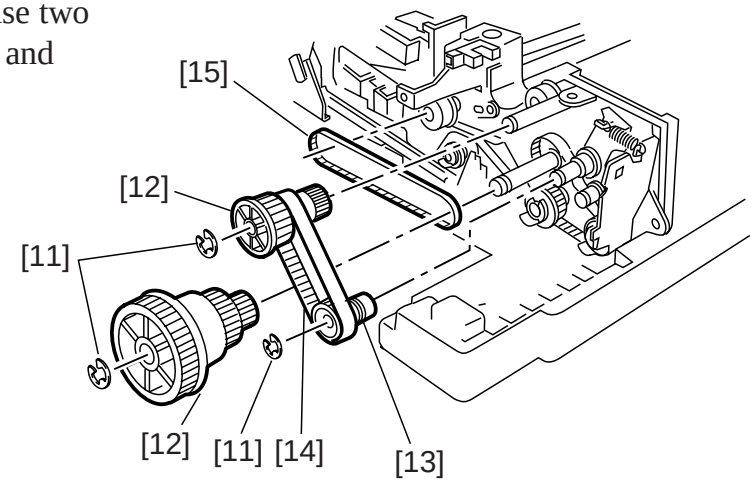
F03-201-13

6) Detach motor drive timing belts [9] and [10].



F03-201-14

7) Detach three E-rings [11] to release two pulley [12], one-way clutch [13], and timing belts [14], [15].



F03-201-15

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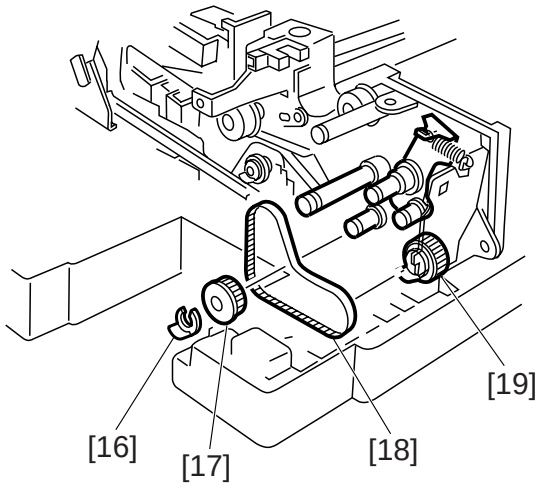
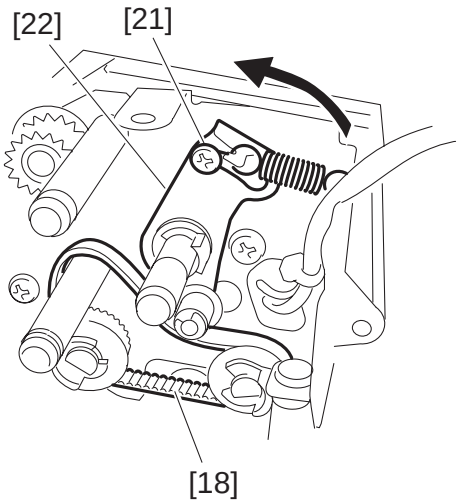
8) Detach plastic E-ring [16] to release pulley [17] and timing belt [18]. The feed mechanism must be removed before pulley [19] can be detached.



F03-201-16

Before attaching timing belt [18], loosen screw [21] on tension arm [22] and press the arm in the counterclockwise direction to attach the timing belt. When the timing belt has been attached, remember to clamp screw [21].



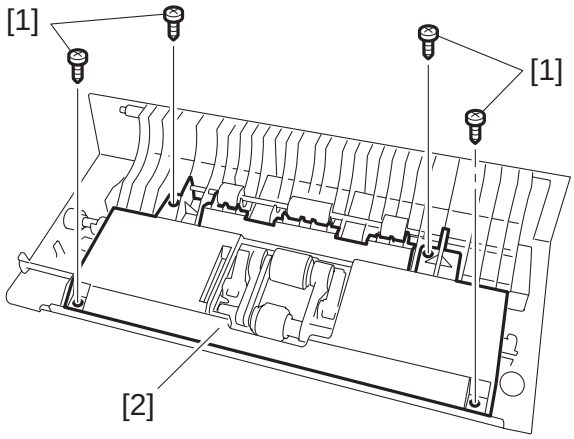
F03-201-17

3. Feed System

3.1 Feeder Cover

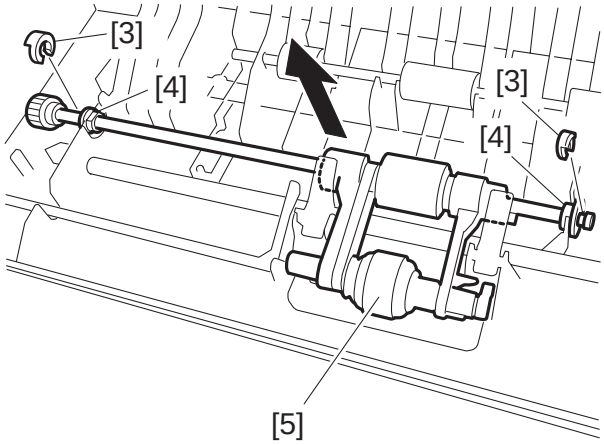
3.1.1 Releasing the pickup roller assembly

1) Detach the feeder cover. (See P.3-4.)
2) Remove four screws [1] to detach inner cover [2] from the feeder cover.



F03-301-01

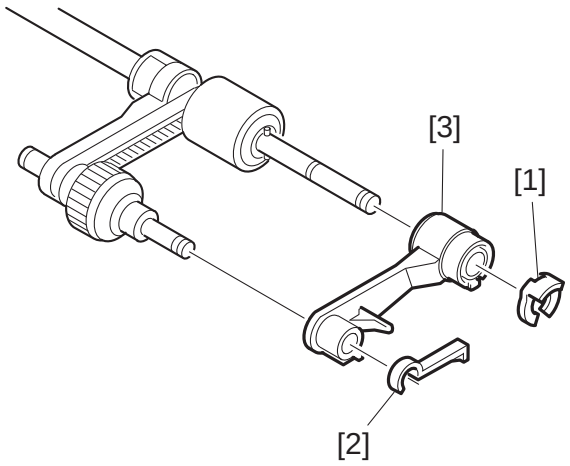
3) Detach two plastic E-rings [3] and two bushings [4] to release pickup roller assembly [5].



F03-301-02

3.1.2 Removing the pickup roller/separation roller

1) Remove the pickup roller.
2) Detach plastic E-ring [1] and stop lever [2] and pull out pickup roller support plate [3].



F03-301-03

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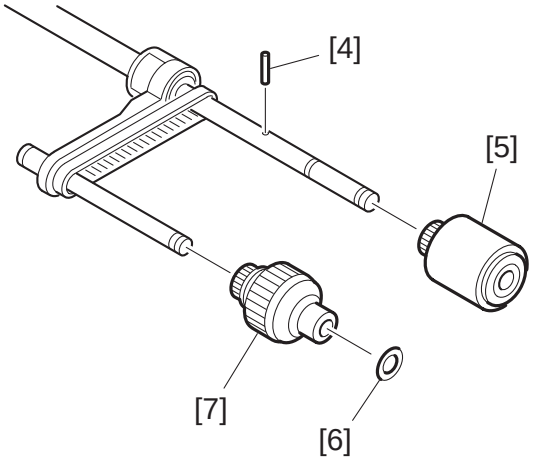
3) Remove pin [4] to release separation roller [5].
4) Remove washer [6] and pickup roller [7].

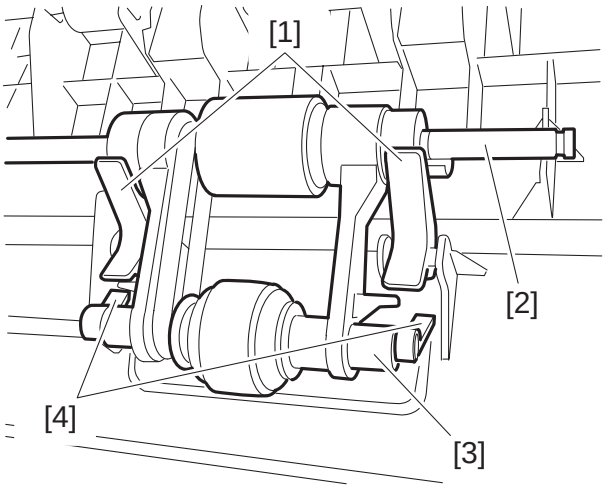


F03-301-04

> Be careful not to lose pin [4] and washer [6] as they are detached at removal.

3.1.3 Mounting the pickup roller assembly

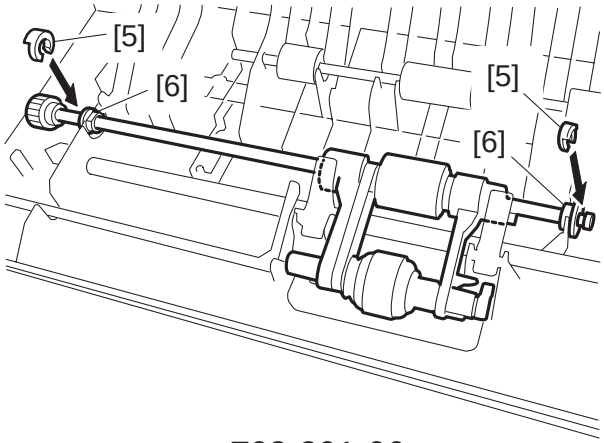
1) With left and right stopper arms [1] erected, mount the pickup roller assembly so as to have the stopper arms placed between separation roller shaft [2] and pickup roller shaft [3].



F03-301-05

> Ensure that the lever position of stop lever [4] will be positioned under stopper arm [1].

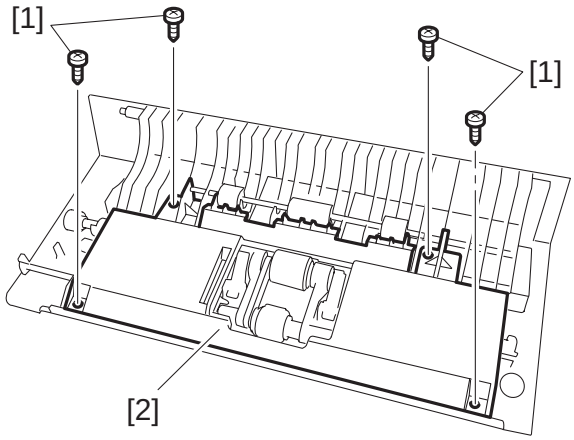
2) Secure the pickup roller assembly by attaching two plastic E-rings [5] and two bushing [6].
3) Replace the feeder cover inner cover in original position and secures it with four screws.



F03-301-06

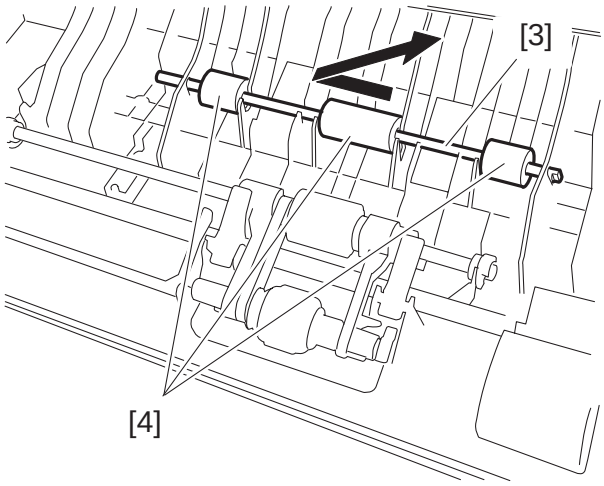
3.1.4 Releasing the registration roller, upper

1) Detach the feeder cover.
2) Remove four screws [1] to detach inner cover [2] from the feeder cover.



F03-301-07

3) With shaft [3] pulled out in the illustrated direction, release registration roller, upper [4].



F03-301-08

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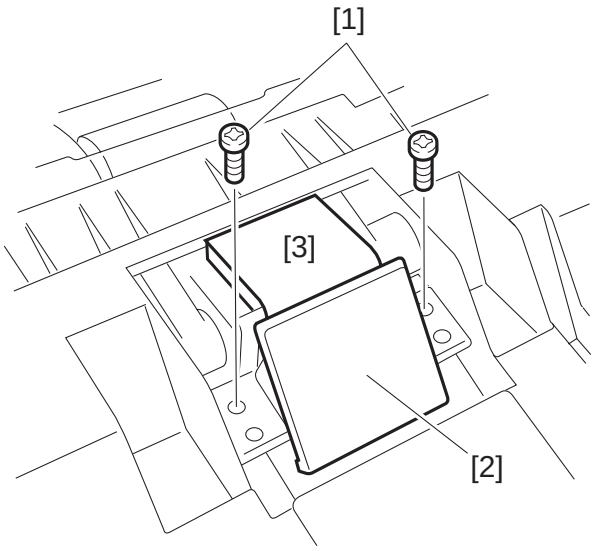
3.2 Feed System

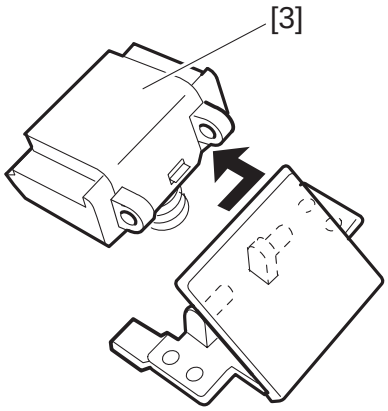
3.2.1 Removing the separation plate/separation pad

1) Open the feed cover.
2) Remove two screws [1] to release separation plate [2] and separation pad [3].



F03-302-01

3) Slide separation pad [3] out of position as illustrated.

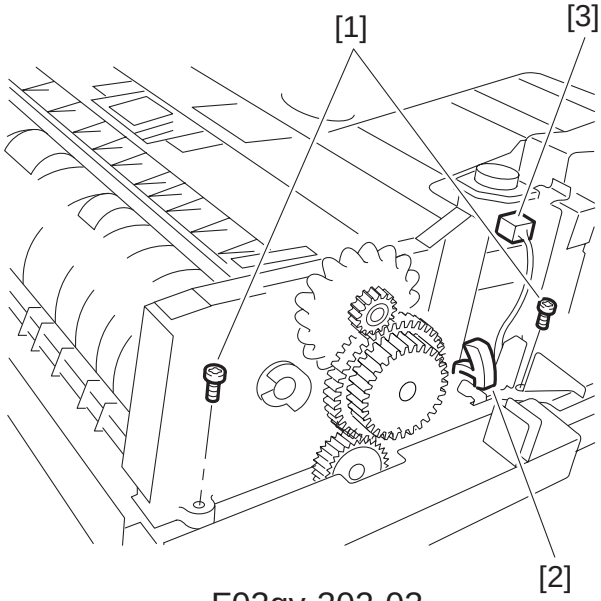


F03-302-02

3.2.2 Removing the feed station

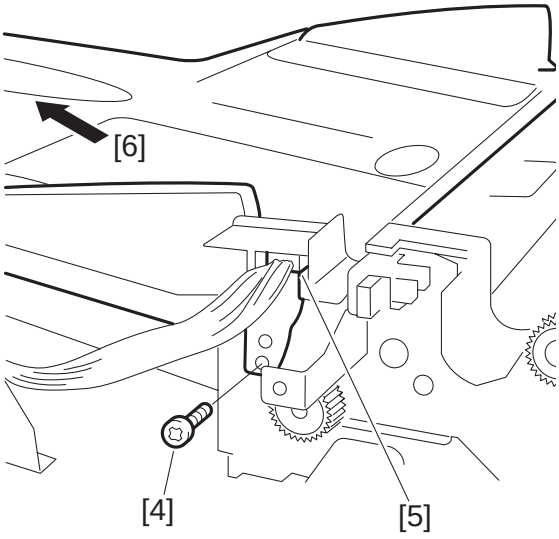
When detaching the feed mechanism components (separation roller, registration roller, lower, read roller, read roller, platen roller, delivery reversal roller, etc.), release the feed station as a whole by following these steps:

1) Detach the front cover, rear cover, and feeder cover.
2) Disassemble the drive mechanism.
3) Remove two screws [1] from the front cover to release locking support [2] and connector [3].



F03gv-302-03

4) Remove screw [4] to pull out bushing [5] and then release document pickup tray [6].



F03-302-04

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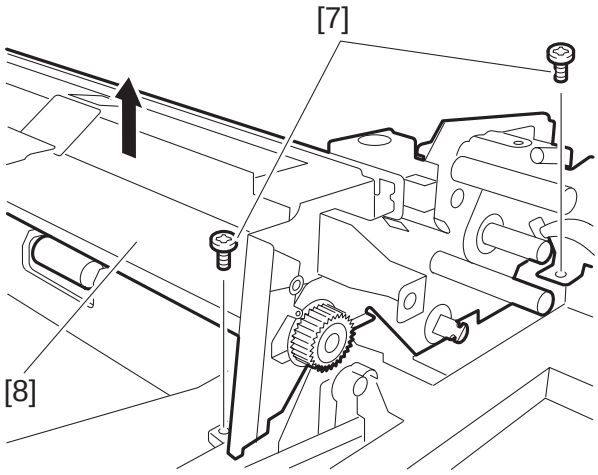
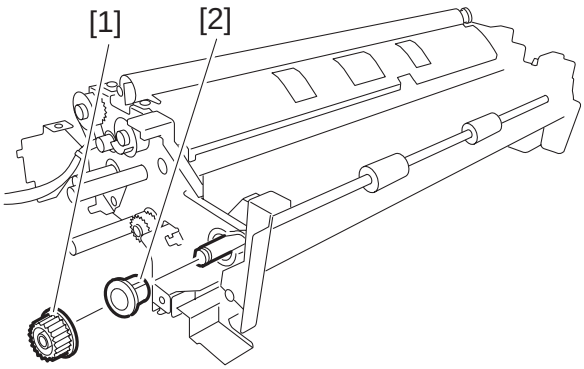
5) Remove two screws [7] to release feed station [8].



F03-302-05

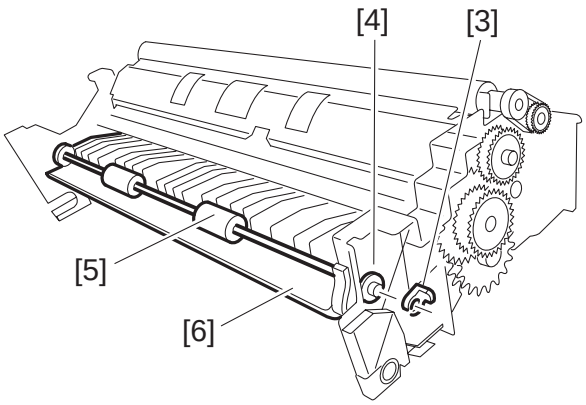
3.2.3 Removing the delivery reversal roller, upper

1) Remove the feed station. (See P.3-16.)
2) Reverse the feed station and pull out pulley [1] and bushing [2].



F03-302-06

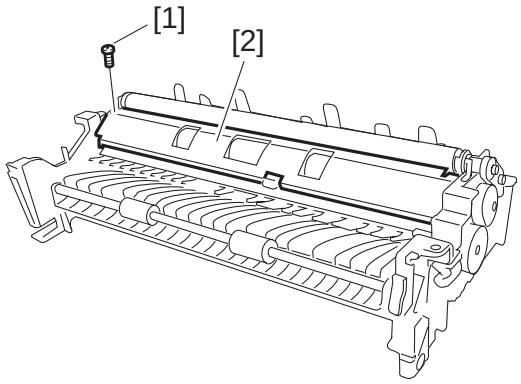
3) Detach plastic E-ring [3] to release bushing [4].
4) Remove reversal delivery roller, upper [5] and separation guide [6].



F03-302-07

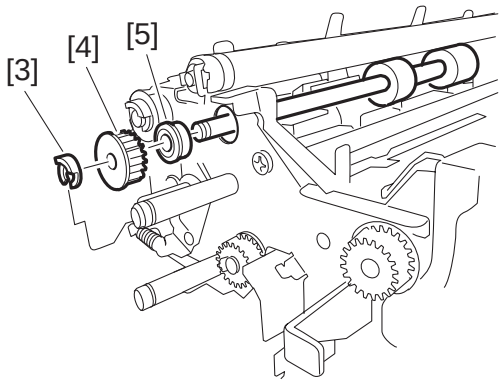
3.2.4 Removing read roller 2

1) Remove the feed station. (See P.3-16.)
2) Remove screw [1] to release platen guide R [2].



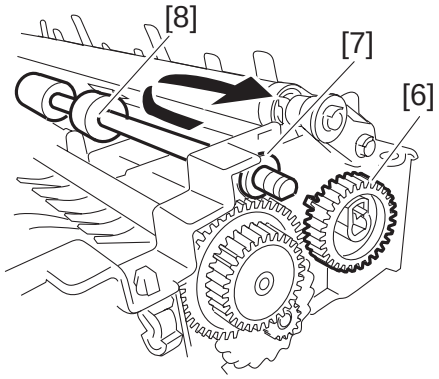
F03-302-08

3) Detach plastic E-ring [3] to release pulley [4] and bearing [5].



F03-302-09

4) Detach gear [6] and bushing [7] to remove gear [6], widen its claw.
5) Lifting read roller 2[8] along the clearance in the shaft hole as illustrated, slide it out of position.



F03-302-10

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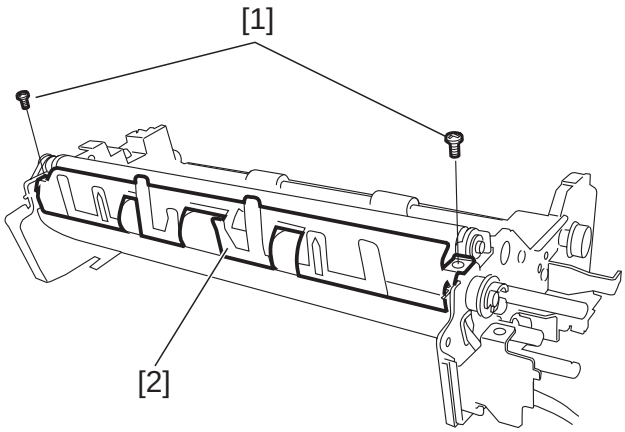
3.2.5 Removing the platen roller

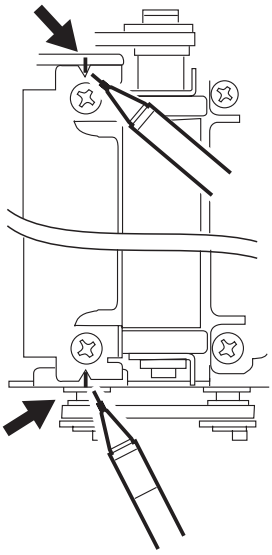
1) Remove the feed station. (See P.3-16.)
2) Remove two screws [1].



F03-302-11

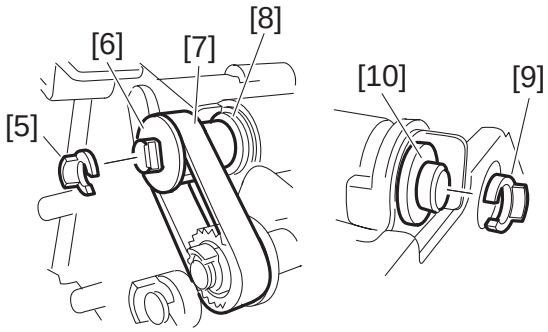
3) Remove platen guide L[2].

Platen guide L [2], if detached, would require gap adjustment with the platen roller upon reassembly.
Mark the notched part of platen guide L before removal to have this mark aligned with the notch at reassembly to save the adjustment effort.



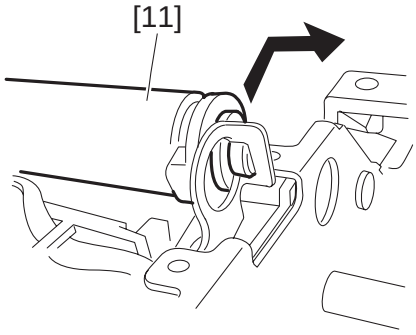
F03-302-12

4) Detach plastic E-ring [5] to release pulley [6], timing belt [7], and bushing [8].
5) Detach plastic E-ring [9] to release bushing [10].



F03-302-13

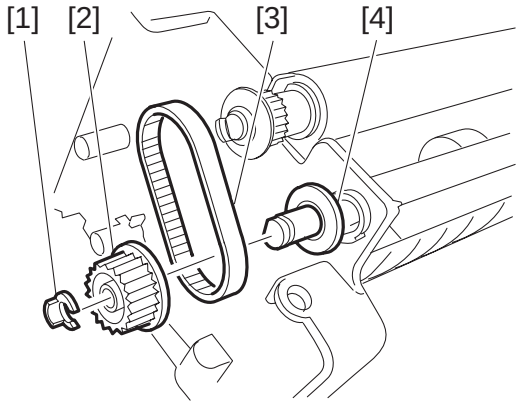
6) Detach platen roller [11] illustrated.



F03-302-14

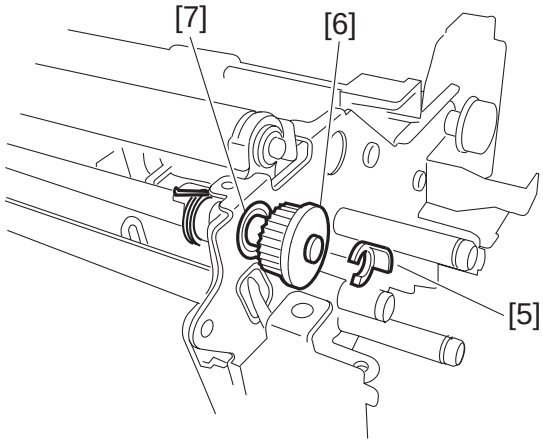
3.2.6 Removing read roller 1

1) Remove the feed station. (See P.3-16.)
2) Detach platen guide L. (Removing the platen roller; see P.3-19.)
3) Detach plastic E-ring [1] to release pulley [2], timing belt [3], and bushing [4].



F03-302-15

4) Detach plastic E-ring [5] to release pulley [6] and bearing [7].



F03-302-16

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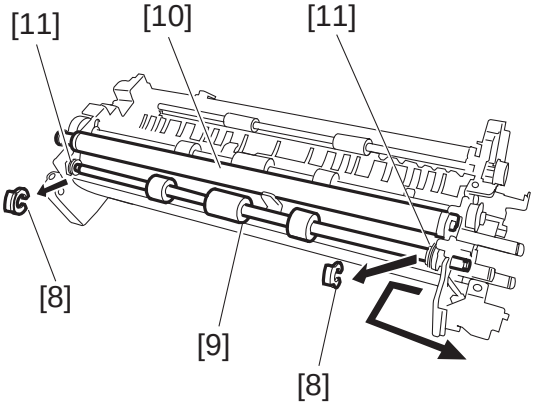
5) Detach two plastic E-rings [8] to release read roller 1 [9] as illustrated.



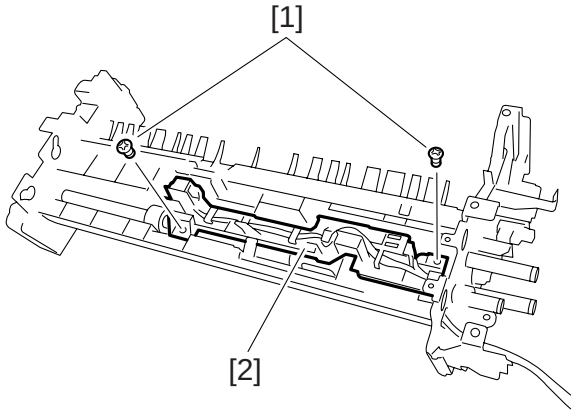
F03-302-17

Be careful not to lose arm spring [11] as platen roller [10] is detached together with the arm when read roller1 [9] is detached.

.

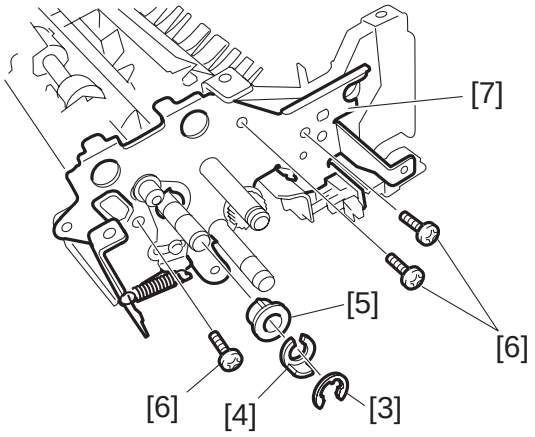
3.2.7 Removing the registration roller, lower

1) Remove the feed station. (See P.3-16.)
2) Remove reversal delivery roller, upper, read roller 2, and read roller 1.
3) Remove two screws [1] to release sensor assembly [2].



F03-302-18

4) Remove E-ring [3], plastic E-ring [4], and bushing [5] , three screws [6] to release metallic frame [7].



F03-302-19

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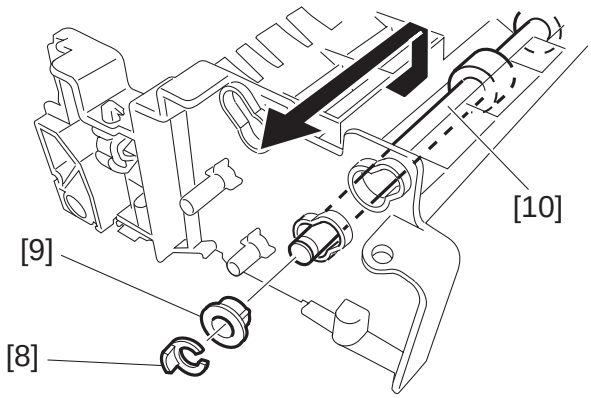
5) Detach plastic E-ring [8] and bushing [9] to release registration roller, lower [10].



F03-302-20

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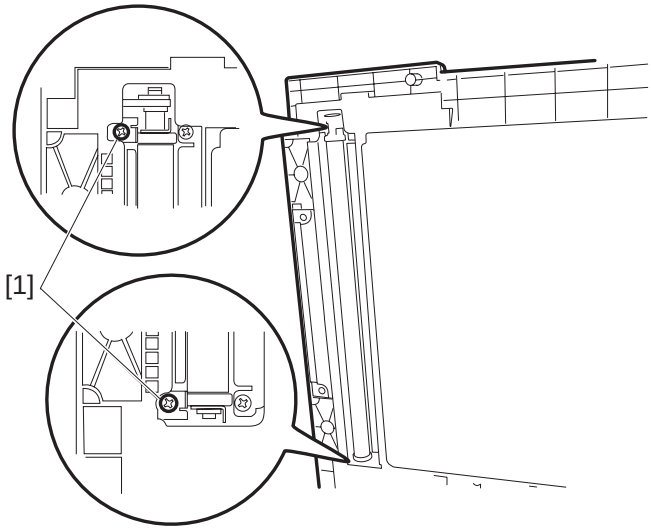
3.2.8 Adjusting platen guide L

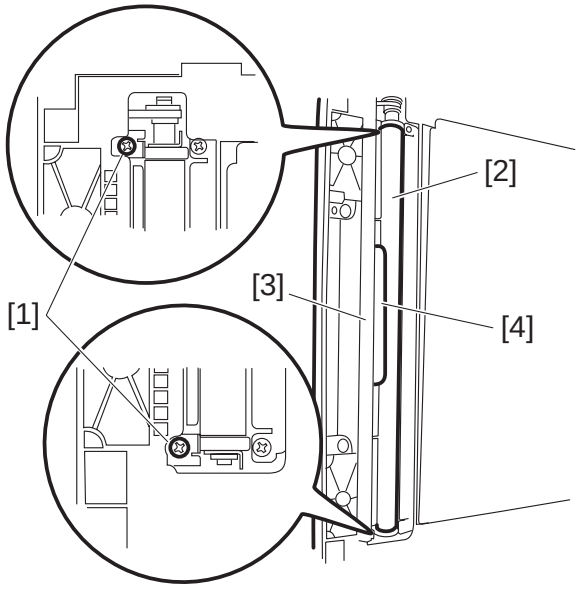
Platen guide L, if detached, would require gap adjustment with the platen roller upon reassembly.

1) Opening the ADF, loosen two platen guide mounting screws [1].



F03-302-21

2) Platen roller [2], and Platen guide with a gauge (dedicated too: 1.4 mm gap) [4] inserted in the clearance between platen roller [2] and platen guide L [3] by about 2 mm, tighten two screws [1] with platen guide L [3] pressed against the gauge.



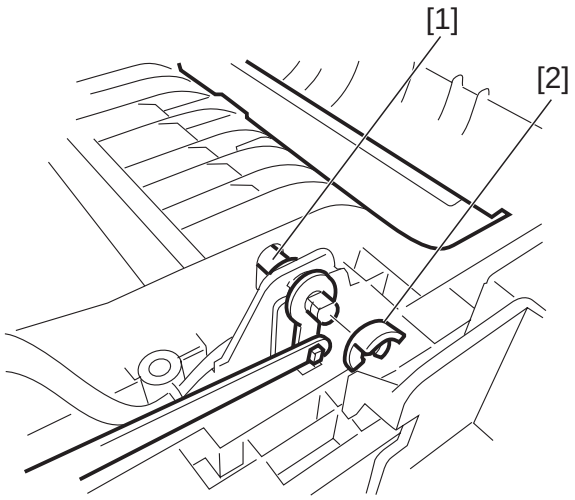
F03-302-22

3.2.9 Removing the delivery reversal roller, lower

To replace only roller element [1] of the reversal delivery roller, lower, open the document pickup tray and lift the roller element to remove.
If it is necessary to pull out the reversal delivery roller, lower as a whole, disassemble it by following these steps:

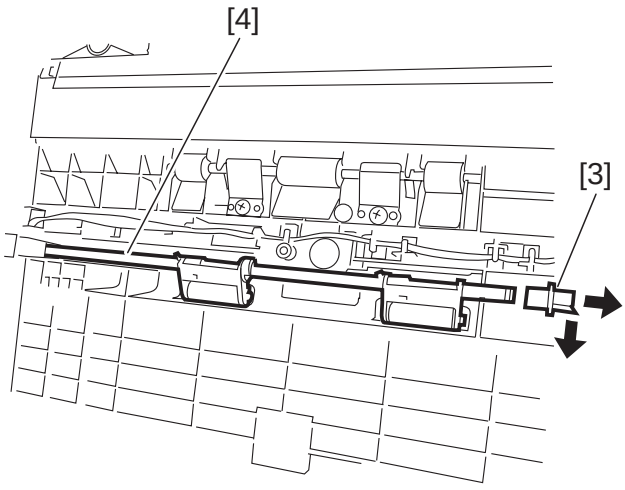
1) Remove the feed station. (See P.3-16.)
2) Detach plastic E-ring [2].
3) Remove blank plate (crimp plate)[3].

Blank plate (crimp plate) is bonded to the frame by double-sided sponge tape (at eight points).
If blank plate (crimp plate) has been removed, reattach it to the frame by using new double-sided sponge tape.



F03-302-23

4) Pull out bushing [3] by pulling its claw and release reversal delivery roller, lower [4].



F03-302-24

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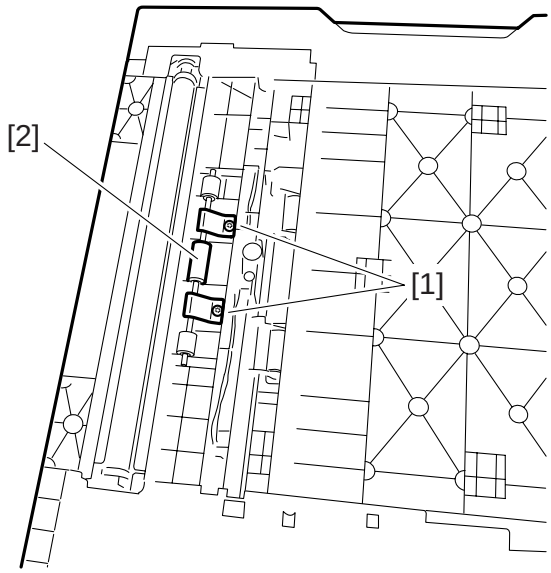
3.2.10 Detaching read roller 2 roller

1) Remove blank plate (crimp plate)[1].

Blank plate (crimp plate) is bonded to the frame by double-sided sponge tape (at eight points).
If blank plate (crimp plate) [1] has been removed, reattach it to the frame by using new double-sided sponge tape.

2) Remove two screws [1] to release read rollers 2 roller.

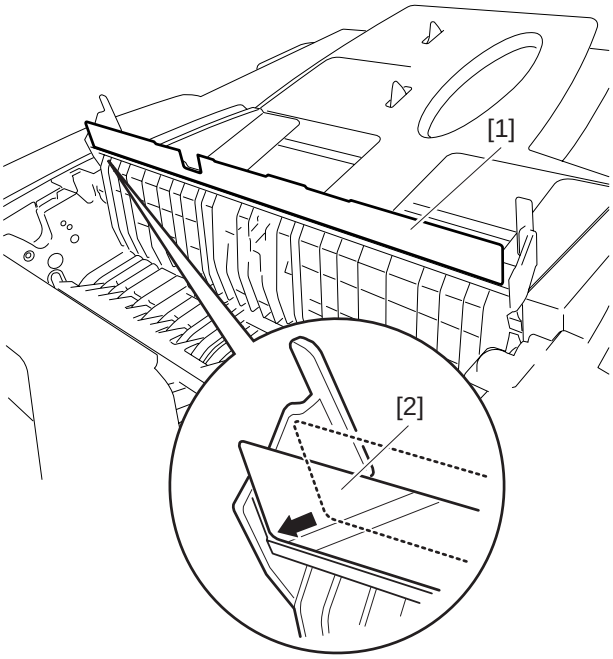


F03-302-25

3.2.11 Replacing the separation guide sheet

1) Open the feeder cover, then the separation guide.
2) Remove separation guide sheet [1] and clean the attachment area and its surrounding areas with a lens cleaning wiper or similar material saturated with alcohol.
3) Attach new separation guide sheet [2] as shown at right.

Press the new separation guide sheet pressed against the stopper both vertically and horizontally to attach.



F03-302-26

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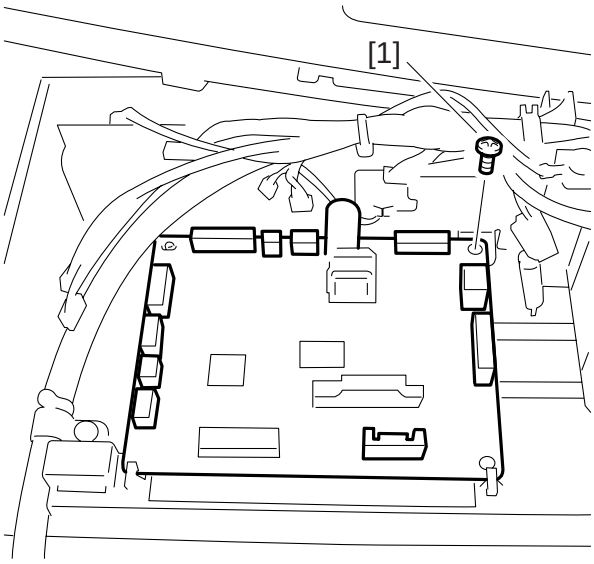
4. Electrical

4.1 ADF Controller PCB

4.1.1 Removing the ADF controller PCB

1) Detach the rear cover.
2) Pull out all ADF controller PCB connectors.
3) Remove screw [1] to release the ADF controller PCB.

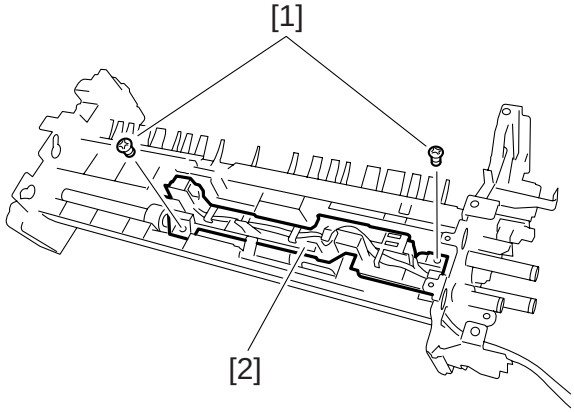


F03-401-01

4.2 Feed Station Sensors

4.2.1 Removing the sensor assembly

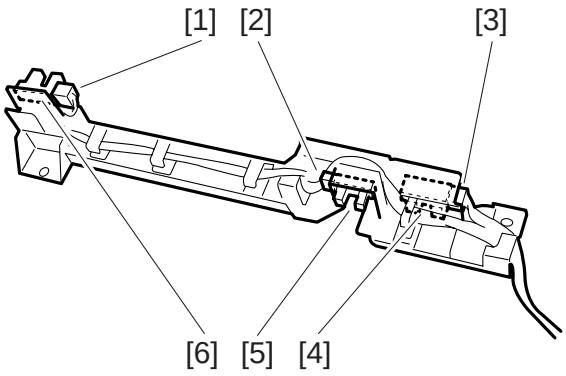
1) Remove the feed station.
2) Remove the reversal delivery roller, upper, read roller 2, and read roller 1.
3) Remove two screws [1] to release sensor assembly [2].



F03-402-01

4.2.2 Removing sensors

1) Remove connectors [1], [2], [3].
2) Remove registration roller paper sensor [4], read sensor [5], and post-separation sensor [6].

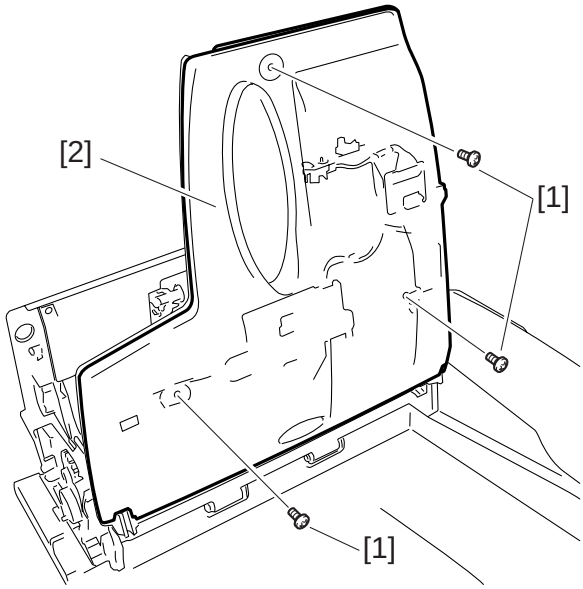


F03-402-02

4.3 Document Pickup Tray Sensors

4.3.1 Removing the document width detection variable resistor

1) Detach the front cover.
2) Raise the document pickup tray.
3) Remove three screws [1] to detach cover [2].



F03-403-01

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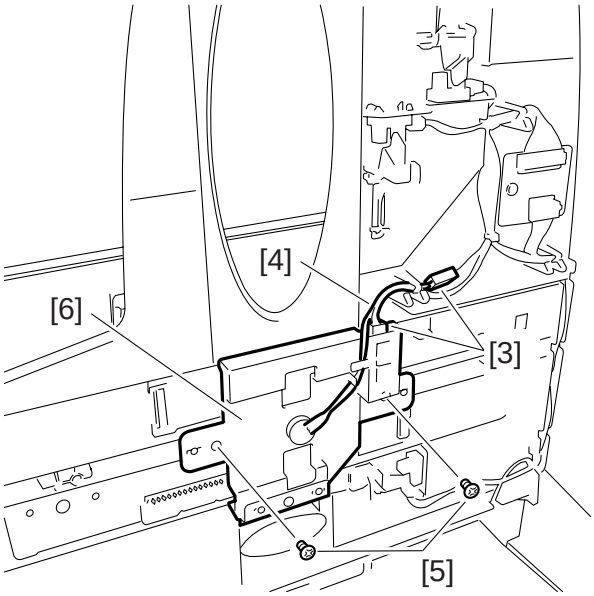
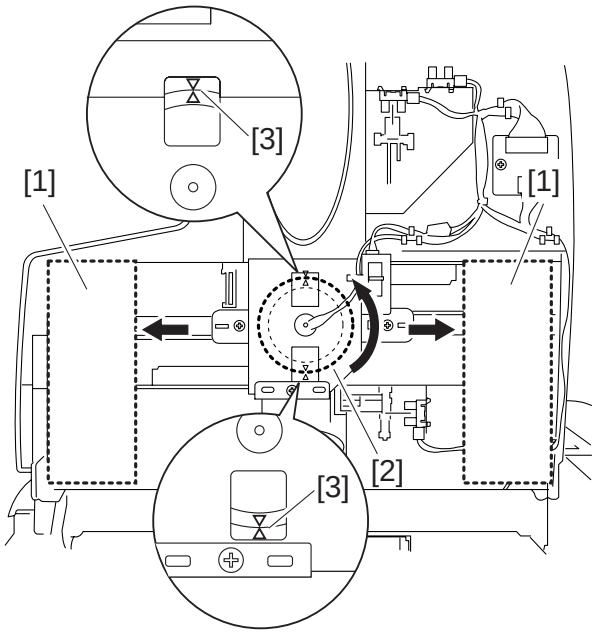
4) Remove two connectors [3] to release harness [4] from the harness guide.
5) Remove two screws [5] to release document width detection variable resistor [6].



F03-403-02

4.3.2 Installing the document width detection variable resistor

1) Widen side guide [1] fully.
2) Turn gear [2] fully counterclockwise as viewed from the gear to locate it where arrow marks [3] meet.

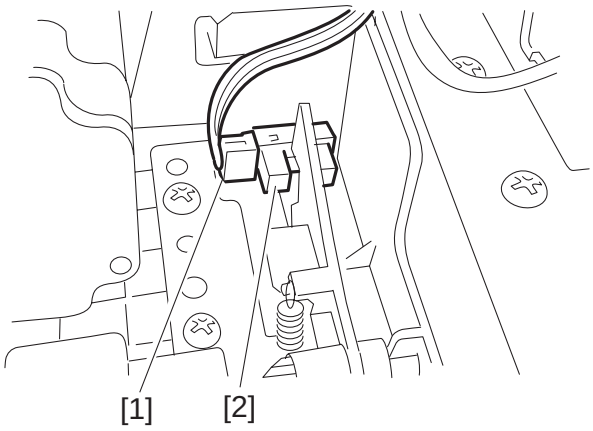


F03-403-03

4.4 Other Sensors and Solenoids

4.4.1 Removing the ADF open/closed sensor switch

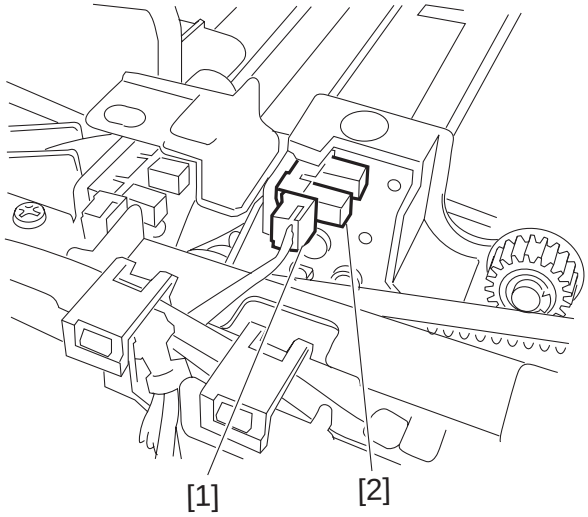
1) Detach the rear cover.
2) Remove connector [1].
3) Remove ADF open/closed sensor [2].



F03-404-01

4.4.2 Removing the cover open/closed sensor

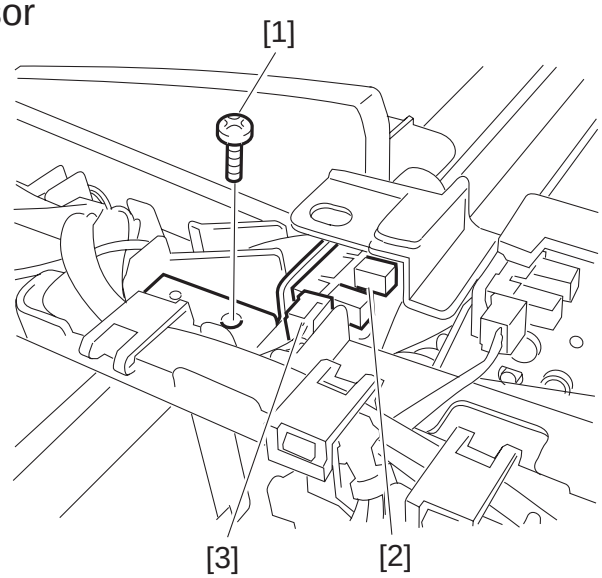
1) Detach the rear cover.
2) Remove connector [1].
3) Remove cover open/closed sensor [2].



F03-404-02

4.4.3 Removing the document set sensor

1) Detach the rear cover.
2) Remove screw [1].
3) Remove document set sensor [2] together with the bracket and then remove connector [3].



F03-404-03

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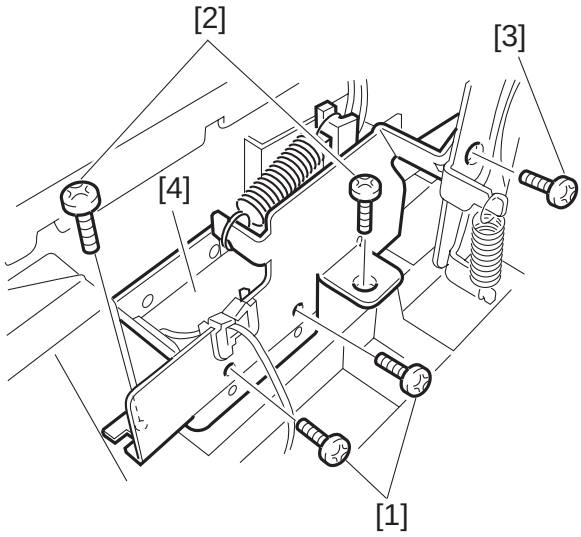
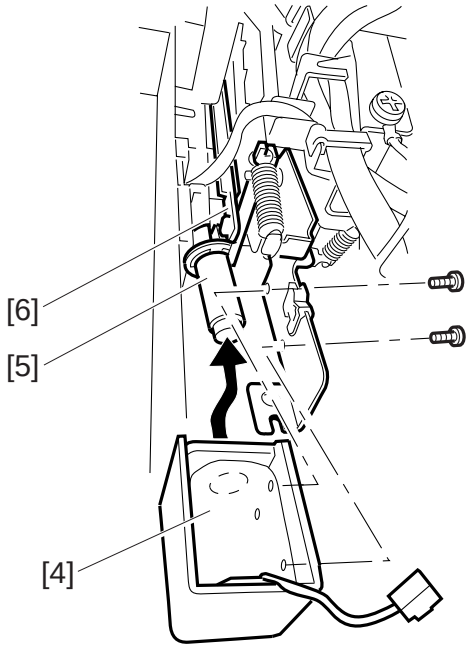
4.4.4 Removing the locking solenoid

1) Detach the rear cover.
2) Remove the ADF controller circuit board.
3) Remove two screws [1] and screw [2] to release locking solenoid [3].



F03-404-04

When installing the locking solenoid, have plunger [5] assembled into link [6] before mounting locking solenoid [4] on the bracket.



F03-404-05

CHAPTER 4

MAINTENANCE AND INSPECTION

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1 Parts Requiring Periodic Replacement

This ADF does not involve parts that require periodic replacement.

2 Expendable Parts Durability Table

The table below lists the average life expectancies (number of sheets picked up) for those parts that may have to be replaced at least once because of degradation or breakage during the product warranty period but that may be safely replaced when the need arises.

Pickup sheet counts for this ADF can be checked by setting the host in service mode.

As of March 2001

No.	Description	Part No.	Quantity (pieces)	Durability guideline	Remarks
1	Pickup roller	FB5-9446	1	80,000 sheets	Usage sheet counts for these parts can be checked by setting the host in service mode. COPIER>COUNTER>DRBL-2> DF-PU-RL: Pickup roller DF-FD-RL: Separation roller DF-SP-PD: Separation pad
2	Separation roller	FB5-9445	1	80,000 sheets	
3	Separation pad	FF6-1291	1	80,000 sheets	
4	Feed roller guide	FF6-1273	1	80,000 sheets	(Dust-collecting tape)

T04-201-01

These values are estimates and are subject to change to reflect empirical information as it becomes available.

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3 Periodic Service List

Do not use any solvents and greases other than those specified by us. Clean the roller, scraper, etc. because paper chads, dust and other foreign matter adhering to these parts may cause black streaks to appear in the printed image.

△ : Cleaning ● : Replacement × : Oiling □ : Adjustment ◎ : Inspection

Illustration No.	Description	Periodic services 40,000 sheets	80,000 sheets	Remarks
	Document table glass	△		Reader station part
	Document table glass retainer	△		
1	Blank plate (crimp plate)	△		Pickup sheet counts for this ADF can be checked by setting the host in service mode.
2	Platen roller	△		
3	Registration roller, upper	△		COPIER > COUNTER > FEEDER > FEED
4	Registration roller, lower	△		
5	Read roller 2	△		
6	Read roller 1	△		
7	Read roller 1 roller	△		
8	Read roller 2 roller	△		
9	Delivery reversal roller, upper	△		
10	Delivery reversal roller, lower	△		
11	Pickup roller	△	●	
12	Separation pad	△	●	
13	Separation roller	△	●	
14	Separation plate	△		
15	Document pickup tray	△		
16	Separation guide (including sheet)	△		
17	Open/close frame and open/close guide	△		
18	Feed frame (including sheet)	△		
20	Platen guide L	△		
21	Platen guide R	△		
22	Reversal flapper	△		
23	Document delivery station	△		
24	Feed roller guide (Dust-collecting tape)	△	●	
25	Registration roller sheet	△		120,000 sheets
26	DADF height	□		

T04-301-01

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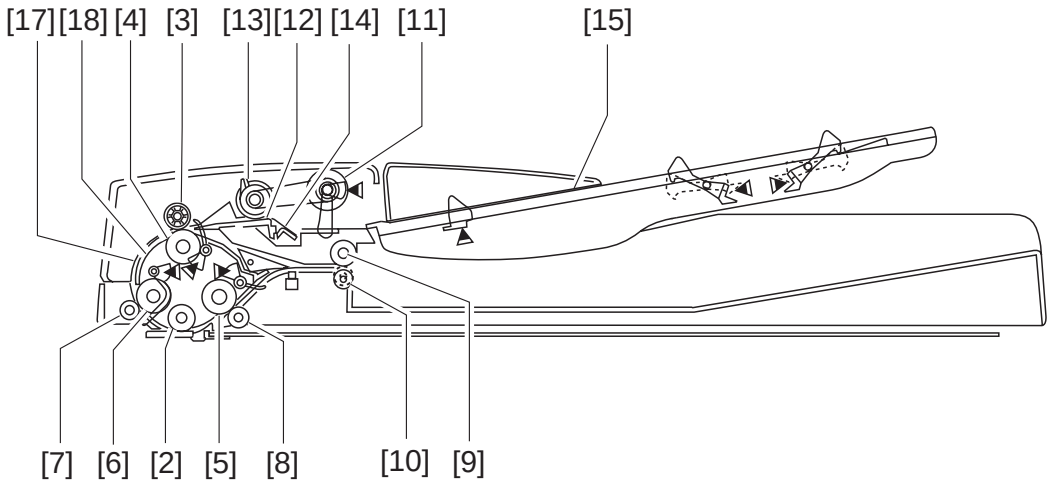
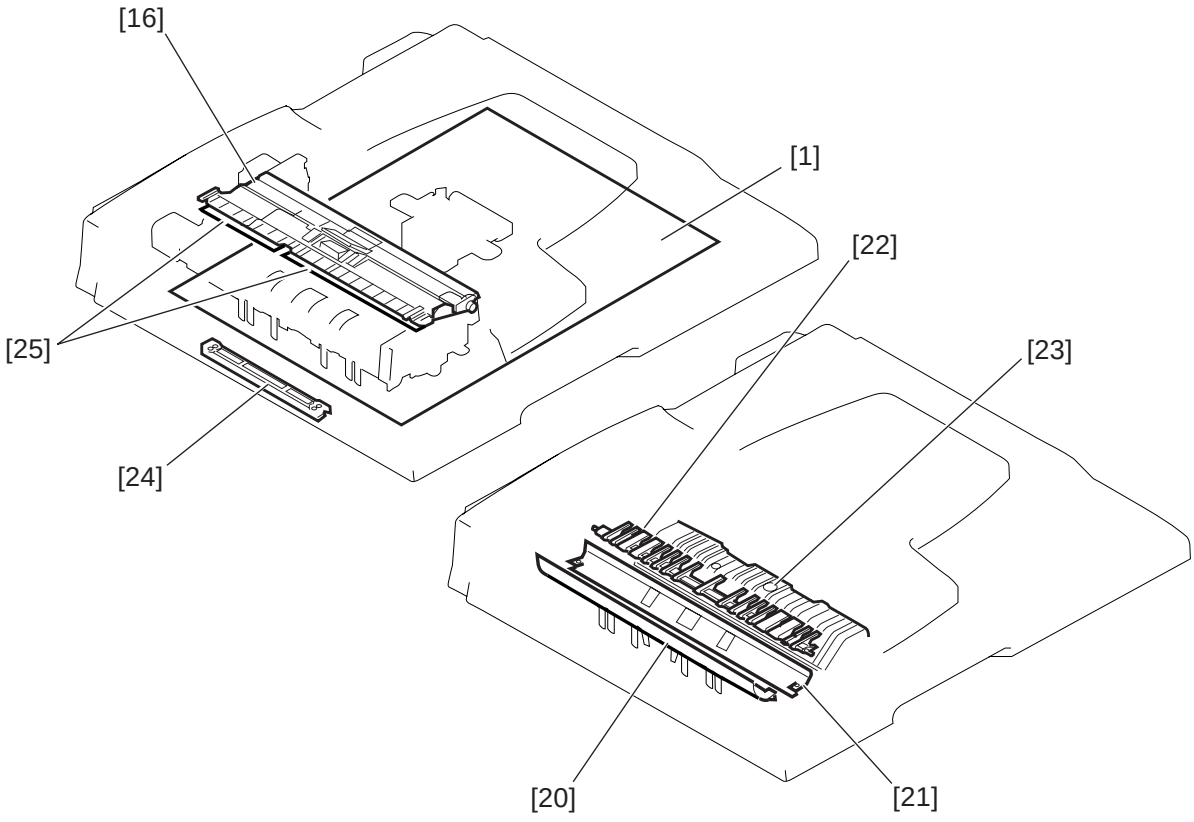
A layout of the parts requiring periodic servicing is shown below.



F04-301-01



F04-301-02

4. Cleaning

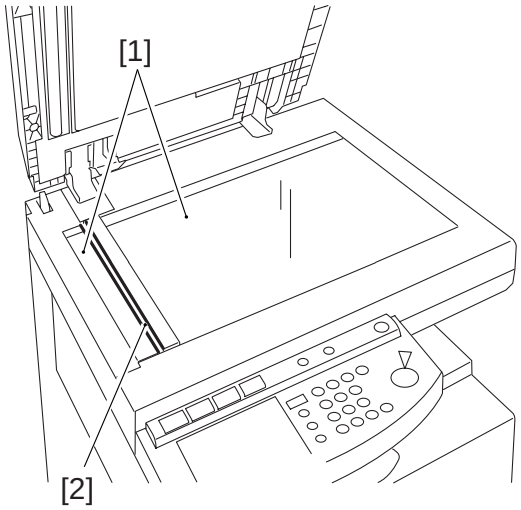
4.1 Reader Station Parts

4.1.1 Document table glass

1) Wipe the document table glasses [1] on the reader station with a cloth saturated with water, then wrung tight or with alcohol, then wipe dry.

4.1.2 document table glass retainer

1) Wipe the document table glass retainer [2] on the reader station with a cloth saturated with water, then wrung tight or with alcohol, then wipe dry.



F04-401-01

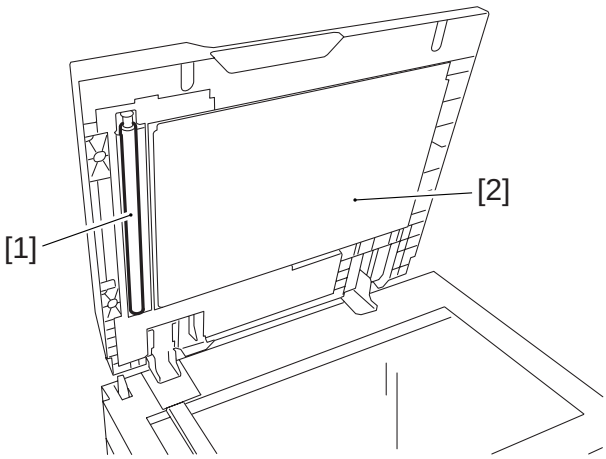
4.2 ADF Parts

4.2.1 Platen guide

1) Wipe platen roller [1] with a cloth saturated with water, then wrung tight or with alcohol, then wipe dry.

4.2.2 Blank plate (crimp plate)

1) Wipe blank plate [2] with a cloth saturated with water, then wrung tight or with alcohol, then wipe dry.



F04-402-01

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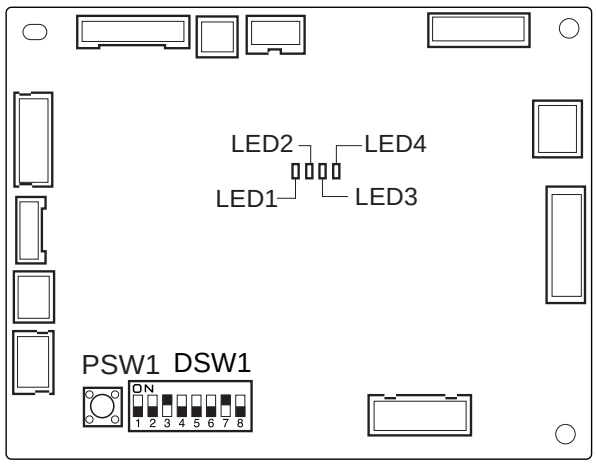
4.3 rollers and Guides

4.3.1 Blank paper feed cleaning

To clean internal ADF rollers (read roller 1, read roller 2), feed blank paper with the host set in service mode upon each passage of 80,000 sheets.

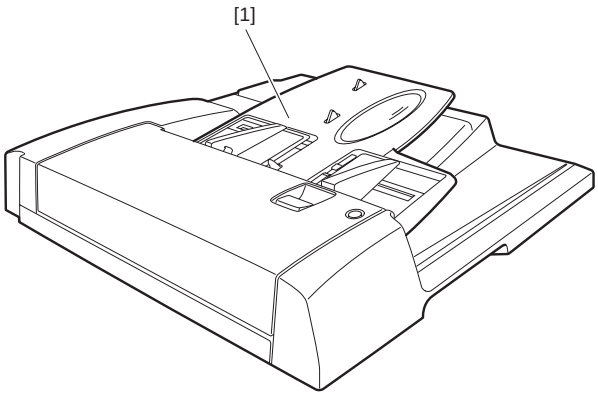
1) Set 10 A4-sized sheets of blank paper in the document pickup tray.
2) Detach the rear cover.
3) Set the DIP switch (DSW1) on the ADF controller PCB as illustrated and press the push switch (PSW1), and the ADF will deliver all blank sheets from the document pickup tray before it comes to a halt.
4) Repeat the above sequence five times.



F04-403-01

4.3.2 Document pickup tray

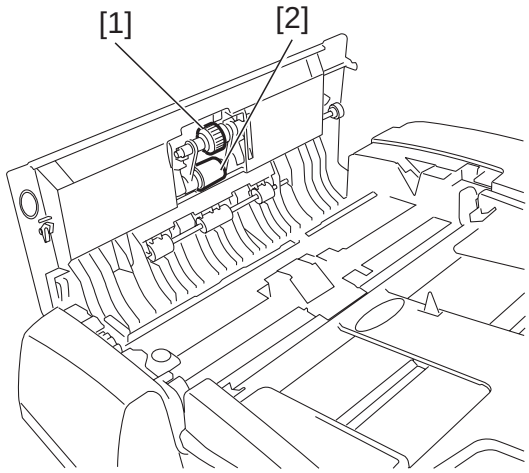
1) Clean document pickup tray [1] with a lens cleaning wiper or similar material saturated with alcohol.



F04-403-02

4.3.3 Pickup roller, separation roller

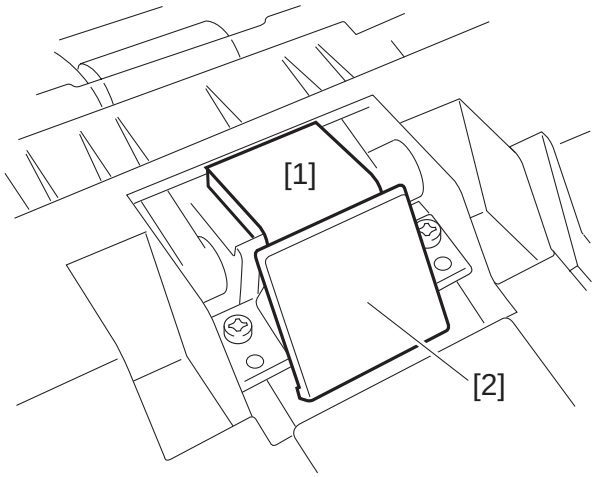
1) Open the feeder cover.
2) Clean pickup roller [1] and separation roller [2] with a lens cleaning wiper or similar material saturated with alcohol.
3) Clean the back of the feeder cover and the paper passage area around the separation roller likewise.



F04-403-03

4.3.4 Separation pad, separation plate

1) Open the feeder cover.
2) Clean separation pad [1] and separation plate [2] with a lens cleaning wiper or similar material saturated with alcohol.



F04-403-04

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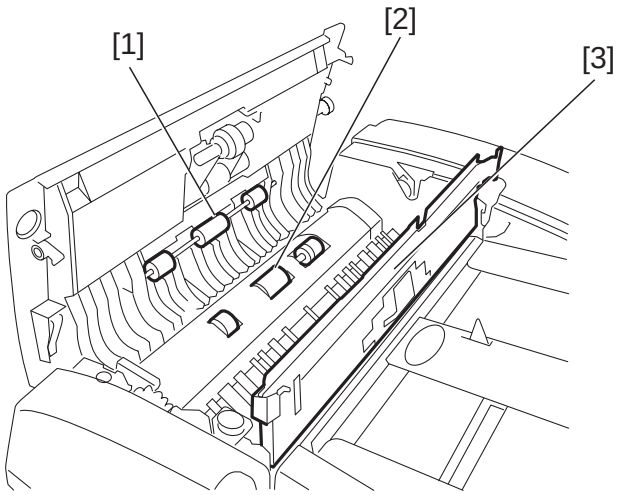
4.3.5 Registration roller, upper, registration roller, lower, separation guide

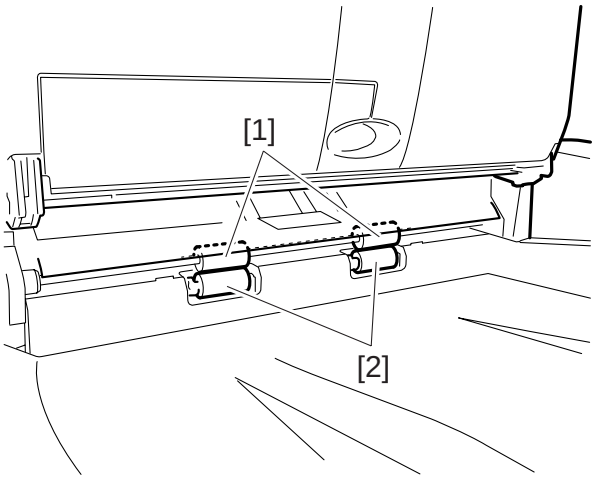
1) Open the feeder cover and the separation guide.
2) Clean registration roller, upper [1] and registration roller, lower [2] with a lens cleaning wiper or similar material saturated with alcohol.
3) Clean the paper passage areas on the top and bottom of the C guide, and Mylar sheet [3].



F04-403-05

4.3.6 Delivery reversal roller, upper, delivery reversal roller, lower

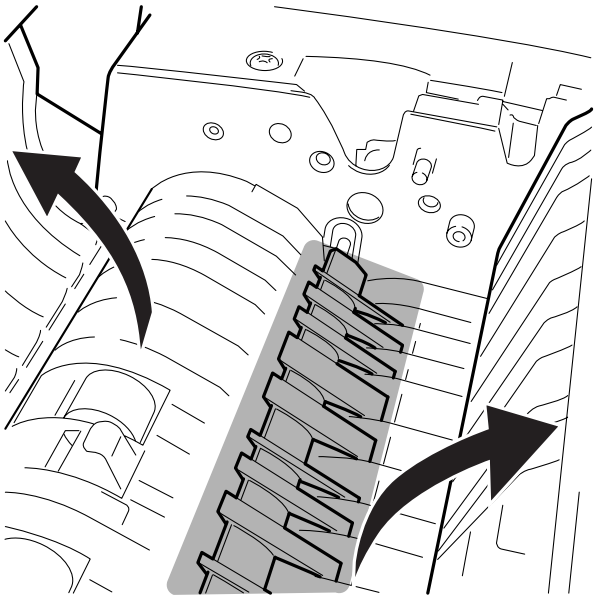
1) Detach the front cover.
2) Open the document pickup tray.
3) While turning delivery reversal roller, upper [1] and delivery reversal roller, lower [2] with the knob, clean them with a lens cleaning wiper or similar material saturated with alcohol.
4) When the cleaning is completed, reattach the front cover.



F04-403-06

4.3.7 Reversal flapper

1) Open the feeder cover and the separation guide.



F04-403-07

2) Clean the paper passage areas on the reversal flapper with a lens cleaning wiper or similar material saturated with alcohol.

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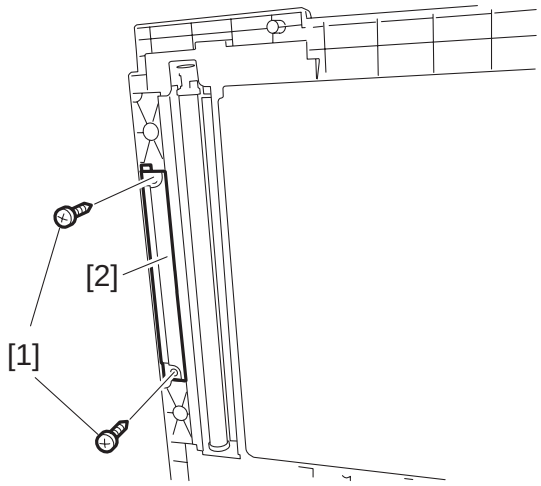
5 Replacement

5.1 Replacing the Feed Roller Guide (Dust-collecting type)

1) Open the ADF.
2) Remove two screws [1] to detach feed roller guide [2].



F04-501-01

3) Mount the new feed roller guide.

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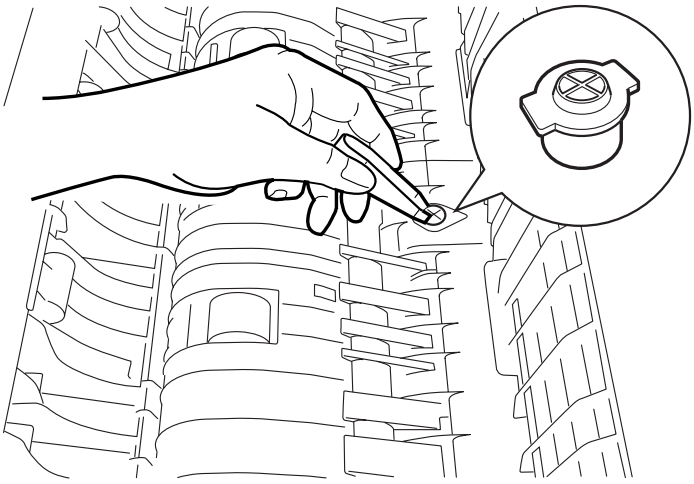
5.2 Replacing the Stamp

1) Open the feeder cover and the separation guide.
2) Remove the stamp by using the tweezers.
3) Attach the new stamp by using the tweezers.
   Mount the stamp facing up.
   To be reprinted from the Installation Instructions



F04-502-01

Be sure to push the stamp into firm position, because an elevated stamp is prone to jams.

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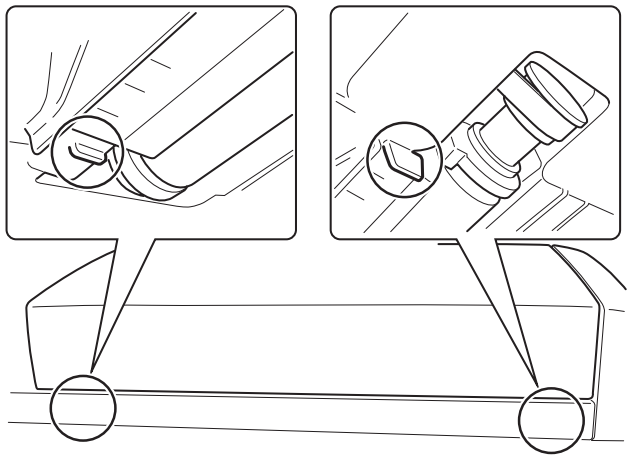
6 Adjustment

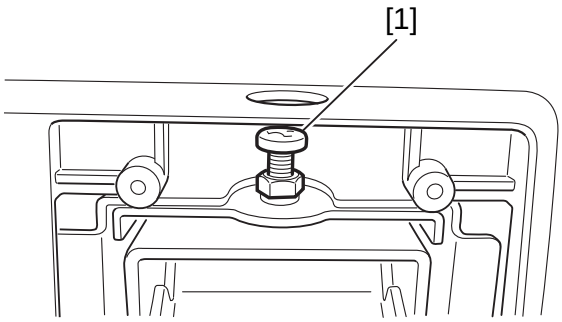
6.1 Adjusting the Height

1) Check to make sure that the copyboard end on the pickup side is in firm contact with the copyboard grass at both front and rear when the DADF is closed.



F04-601-01

2) If one side is not in contact, turn the adjusting screw [1] to adjust the height of the left hinge.
   * If the front is not in contact, tighten the adjusting screw.
   * If the rear is not in contact, loosen the adjusting screw.



F04-601-02

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CHAPTER 5

TROUBLESHOOTING

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1 Specifications and Adjustments

1.1 Basic Adjustments

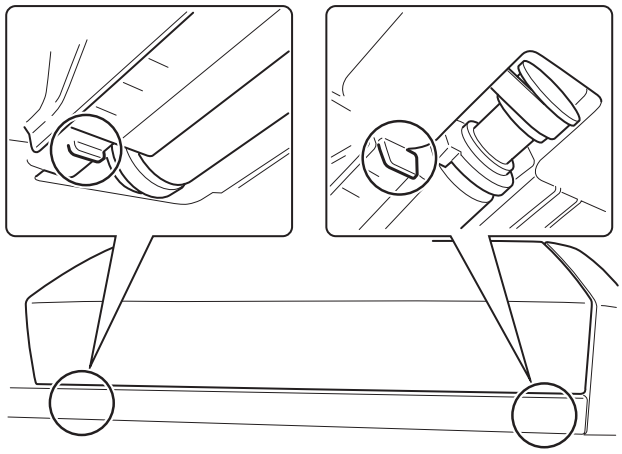
To make basic adjustments with the ADF, carry out these items in sequence:

[1] Height adjustment
[2] Squareness adjustment
[3] Scanning position adjustment*1
[4] Horizontal registration adjustment*2
[5] Scale adjustment*2
[6] Trailing registration adjustment*2

*1: Adjustment from the host set in service mode
*2: Two modes of adjustment are available: adjusting from the ADF and adjusting from the host set in service mode.

1.1.1 Height adjustment

1) Check to see if the pickup side document table stopper comes into contact with document scanning glass [2] both on its front and back when the DADF is closed.



F05-101-01

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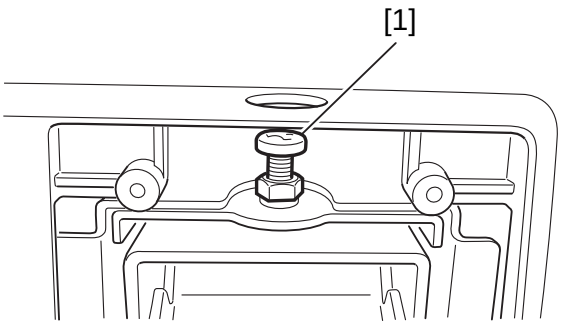
[If out of tolerances]

1) If elevated on one side, turn height adjustment screw [1] in the upper part of the left hinge for adjustment.



If elevated on the front
-> Tighten the adjustment screw.
If elevated in the rear
-> Loosen the adjustment screw.

F05-101-02

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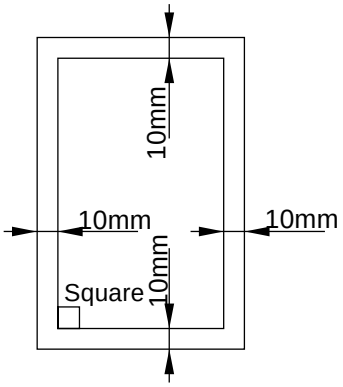
1.1.2 Squareness adjustment

Verify the squareness of the optic system of the host and the document feed direction of this ADF, and adjust it as needed.

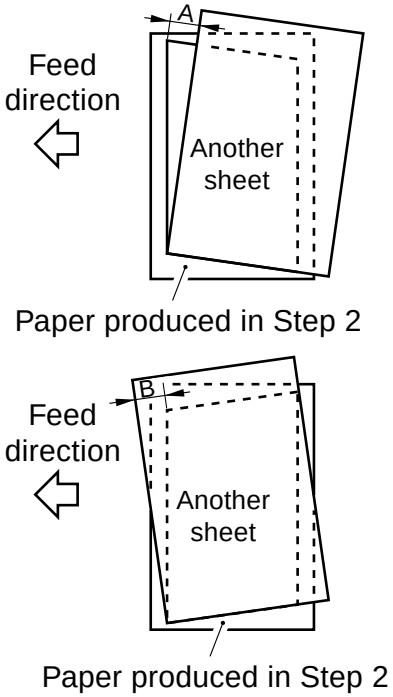
1) Create a test chart shown at right using an A4 or LTR sheet of paper.



F05-101-03

2) Set the test chart created in the document tray and print it in equal size.
3) Superimpose the image produced in Step 2) with the test chart to verify its squareness.
   A ≦ 1mm
   B ≦ 1mm

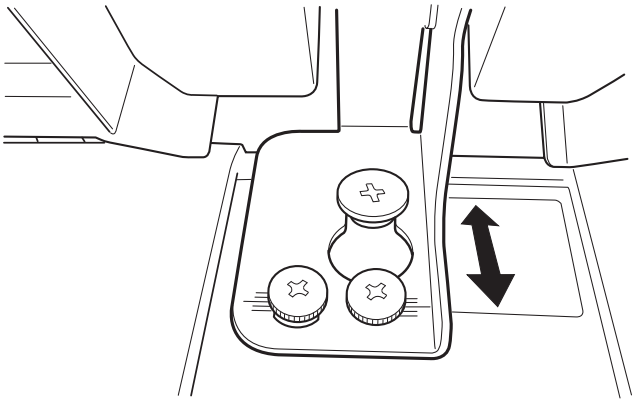
Make this squareness check on a line of the leading part of scanning.



F05-101-04

[If out of tolerances]

1) Loose two knurled screws [1] in the front part of the right hinge unit.
2) Move the right hinge unit back and forth for adjustment.
3) When the adjustment is completed, tighten two knurled screws [1] to secure the right hinge unit in position. Figure 3B-1



F05-101-05

4) Print the test chart again to make sure that the image falls within tolerances of the specifications.

1.1.3 Scanning position adjustment

This adjustment adjusts the flow-scanning position on the host in relation to the scanning position on the ADF.
First, perform automatic adjustment
Perform automatic adjustment first, and if it fails, try manual adjustment.

a. Automatic adjustment

1) Turn on the power to the host to invoke service mode.
2) Press ⊛, 2 and 8 concurrently, and then ⊛ to invoke service mode.
3) Starting from the service mode screen, touch the following screens in this order:
   COPIER > FUNCTION > INSTALL > STRD-POS

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4) Touch OK.
   Touch OK, and the optic system starts scanning. Automatic adjustment is completed in about 30 seconds, with "OK" appearing on the display.

If the automatic adjustment fails, clean the DADF platen roller and the document glass surface of the host and retry the automatic adjustment. If it still fails, try the following manual adjustment procedure:

b. Manual adjustment

1) Turn on the power to the host to invoke service mode.
2) Press ✳, 2 and 8 concurrently, and then ✳ to invoke service mode.
3) Starting from the service mode screen, touch the following screens in this order:
   COPIER > ADJUST > AD-XY > STRT-POS
   The default adjustment value is 30.
4) Find out the optimal value by trying various possible values to verify the resultant images.

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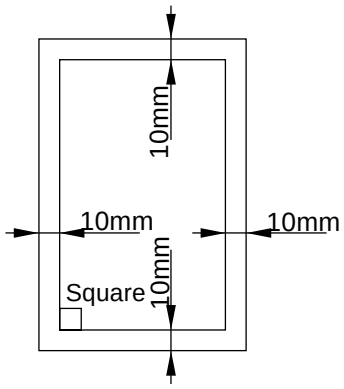
1.1.4 Horizontal registration adjustment

This adjustment corrects drifts in horizontal registration between a document and a copy sheet.
Two modes of adjustment available are:

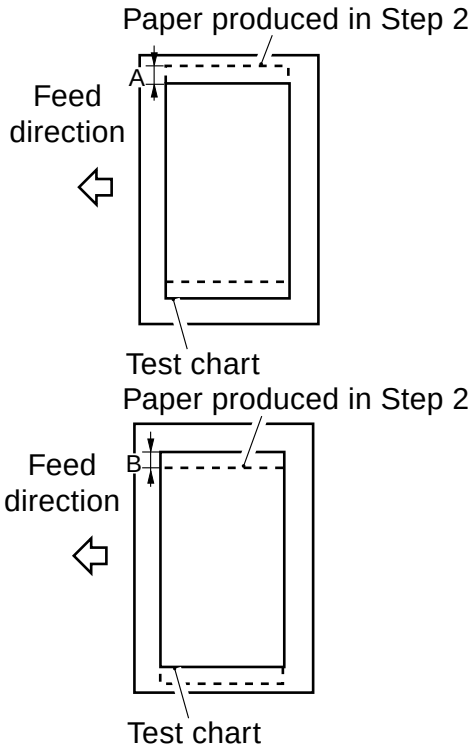
- Adjusting from the host set in service mode
- Adjusting the side regulating plate position of the ADF pickup tray

1) Create a test chart shown at right using an A4 or LTR sheet of paper.



F05-101-06

2) Set the test chart created in the document tray and print it in equal size.
3) Superimpose the image produced in Step 2) with the test chart to verify its compliance with the following tolerances:
   A ≦ 1mm
   B ≦ 1mm



F05-101-07

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[If out of tolerances]

a. Adjusting from the host set in service mode

1) Turn on the power to the host to invoke service mode.
2) Press ✱, 2 and 8 concurrently, and then ✱ to invoke service mode.
3) Starting from the service mode screen, touch the following screens in this order:
   COPIER>ADJUST>ADJUST>ADJ-X
4) Find out the optimal value by trying various possible values.
   Adjustment value unit 1=0.1mm
   - The image is shifted forward.
     -> Increase the value
   - The image is shifted backward.
     -> Reduce the value
5) Print the test chart again to make sure that the image falls within tolerances of the specifications.

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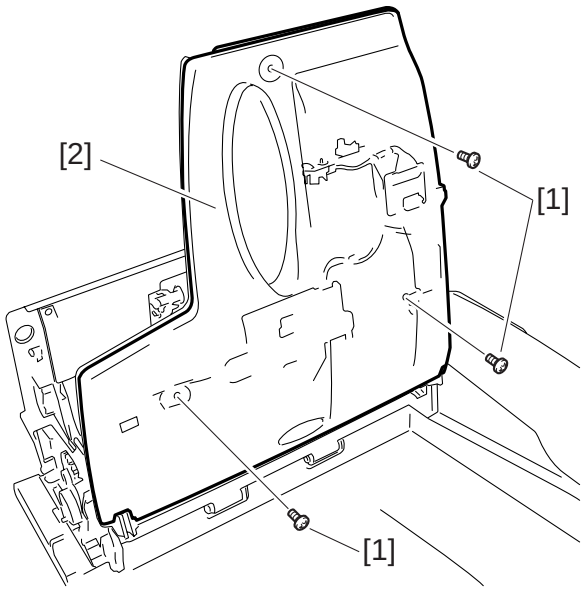
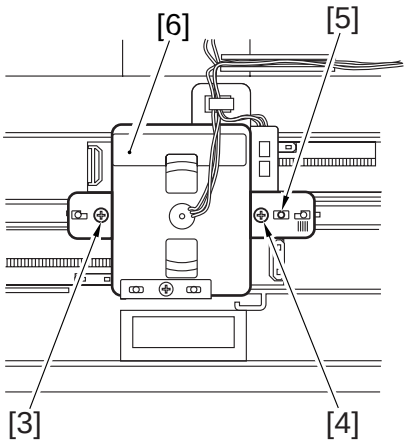
b. Adjusting the side regulating plate position of the ADF pickup tray

1) Remove three mounting screws [1] to detach cover [2].



F05-101-08

2) Loosen mounting screw [3], and remove screw [4] from the fixing hole and fit it into adjustment long hole [5] finger-tight.
3) Move Document width detection variable resistor assembly [6] forward or backward for adjustment.
4) Tighten loose screw [3] and screw [4] fitted in adjustment long hole [5] finger-tight.
5) When the adjustment is completed, reattach cover [2].
6) Print the test chart again to make sure that the image falls within tolerances of the specifications.



A>1mm
: Move variable resistor assembly [6] forward.
B>1mm
: Move variable resistor assembly [6] backward.

F05-101-09

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1.1.5 Scale adjustment

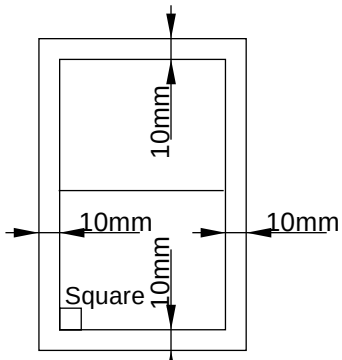
This adjustment adjusts the feed speed for a document to regulate the image feed direction.
Two modes of adjustment available are:

- Adjusting from the host set in service mode
- Adjusting from the ADF controller PCB

Memo

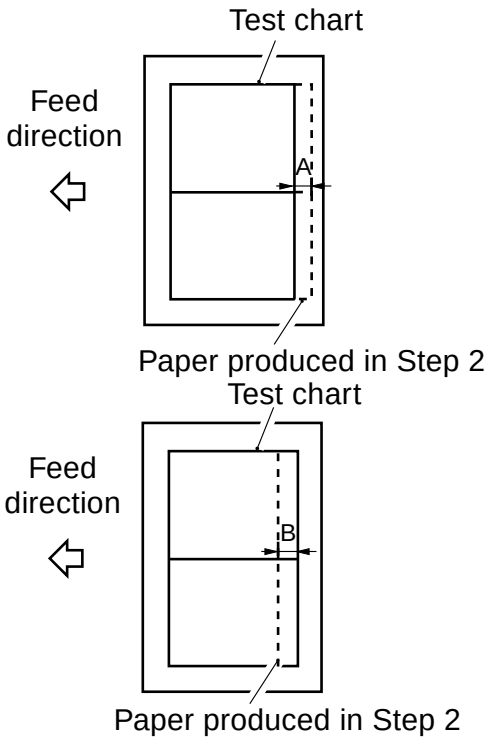
Adjustment would be easier to carry out from the host set in service mode.

1) Create a test chart shown at right using an A4 or LTR sheet of paper.



F05-101-10

2) Set the test chart created in the document tray and print it in equal size.
3) Check to see if size A in the test chart and size B in the image produced in Step 2) comply with the following tolerances:
   A ≦ 1mm
   B ≦ 1mm



F05-101-11

[If out of tolerances]

a. Adjusting from the host set in service mode

1) Press ✳, 2 and 8 concurrently, and then ✳ to invoke service mode.
2) Starting from the service mode screen, touch the following screens in this order:
   FEEDER>ADJUST>LA-SPEED
3) Find out the optimal value by trying various possible values.
   Adjustment value unit 1=0.1%
   - Short image
     -> Reduce the value (for slower document scanning)
   - Long image
     -> Increase the value (for faster document scanning)
4) Print the test chart again to make sure that the image falls within tolerances of the specifications.

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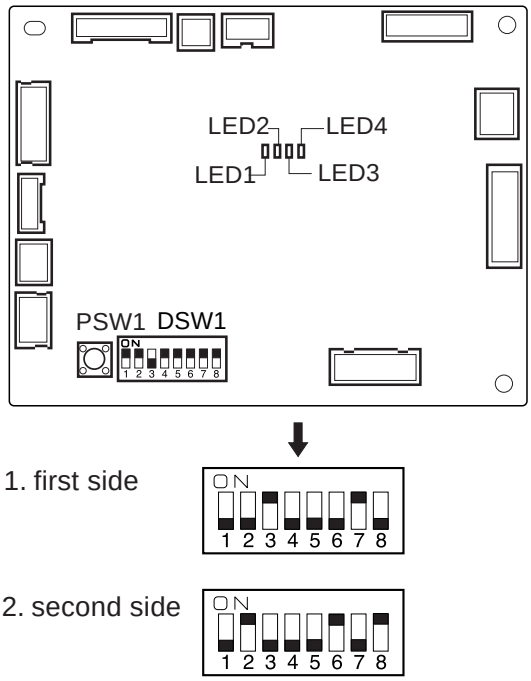
b. Adjusting from the ADF controller PCB

1) Detach the rear cover.
2) Set the DIP switch (DSW1) on the ADF controller PCB as illustrated and press the push switch (PSW1) to let the ADF into scanning speed adjustment mode.

   Set 1 for the first side, 2 for the second side.



F05-101-12

When Scanning speed adjustment mode sets in, ADF controller PCB LED2 will display the current setting.
A setting is displayed in the order of the sign, tens place, and ones place, depending on the mix of the LED2 flashing speed and the flashing count.

1. LED2 lit for 2 seconds: Start of display
2. LED2 off for 1 second
3. Quick display of the sign of the setting (at 0.1 second intervals)
   LED2 flashes twice to indicate positive (+), or once to indicate negative (-).
4. Flashing slowly the number of times specified by the tens place (at 0.8 second intervals)
5. Flashing slowly the number of times specified by the ones place (at 0.2 second intervals)

○ : On ◎ : Flashing ● : Off

1. LED2 on for 2 seconds — 1 2 3 4 ● ○ ● ●
2. LED2 off for 1 second — 1 2 3 4 ● ● ● ●
3. Sign of the setting Flashing once denotes (-) (at 0.1 second intervals). — 1 2 3 4 ● ◎ ● ●
4. Tens place of the setting Flashing twice indicates 2 (at 0.8 second intervals). — 1 2 3 4 ● ◎ ● ●
5. Ones place of the setting Flashing six times indicates 6 (at 0.2 second intervals). — 1 2 3 4 ● ◎ ● ●

* If the setting is positive (+), all LEDs will flash twice quickly in 3.

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3) Enter a document feed speed setting using the ADF controller PCB DIP switch (DSW1). Enter a setting in binary. Bit 1 designates a positive (+) value when OFF, a negative (-) value when ON.
   - The adjustment range is ±30.
   - +1 speeds up the scanning speed by 0.1%.

4) Press the push switch (PSW1) to update the setting as it is displayed by the LED indicator.
5) Print the test chart again to make sure that the image falls within tolerances of the specifications.
6) When the adjustment is completed, set all ADF controller PCB DIP switch (DSW1)bits to OFF.

□ : Switch OFF ■ : Switch ON

Setting	Bit number 1 2 3 4 5 6 7 8	Setting	Bit number 1 2 3 4 5 6 7 8
+1	□ □ □ □ □ □ □ ■	-1	■ □ □ □ □ □ □ ■
+2	□ □ □ □ □ □ ■ □	-2	■ □ □ □ □ □ ■ □
+3	□ □ □ □ □ □ ■ ■	-3	■ □ □ □ □ □ ■ ■
+4	□ □ □ □ □ ■ □ □	-4	■ □ □ □ □ ■ □ □
+5	□ □ □ □ □ ■ □ ■	-5	■ □ □ □ □ ■ □ ■
+6	□ □ □ □ □ ■ ■ □	-6	■ □ □ □ □ ■ ■ □
+7	□ □ □ □ □ ■ ■ ■	-7	■ □ □ □ □ ■ ■ ■
+8	□ □ □ □ ■ □ □ □	-8	■ □ □ □ ■ □ □ □
+9	□ □ □ □ ■ □ □ ■	-9	■ □ □ □ ■ □ □ ■
+10	□ □ □ □ ■ □ ■ □	-10	■ □ □ □ ■ □ ■ □
+11	□ □ □ □ ■ □ ■ ■	-11	■ □ □ □ ■ □ ■ ■
+12	□ □ □ □ ■ ■ □ □	-12	■ □ □ □ ■ ■ □ □
+13	□ □ □ □ ■ ■ □ ■	-13	■ □ □ □ ■ ■ □ ■
+14	□ □ □ □ ■ ■ ■ □	-14	■ □ □ □ ■ ■ ■ □
+15	□ □ □ □ ■ ■ ■ ■	-15	■ □ □ □ ■ ■ ■ ■
+16	□ □ □ ■ □ □ □ □	-16	■ □ □ ■ □ □ □ □
+17	□ □ □ ■ □ □ □ ■	-17	■ □ □ ■ □ □ □ ■
+18	□ □ □ ■ □ □ ■ □	-18	■ □ □ ■ □ □ ■ □
+19	□ □ □ ■ □ □ ■ ■	-19	■ □ □ ■ □ □ ■ ■
+20	□ □ □ ■ □ ■ □ □	-20	■ □ □ ■ □ ■ □ □
+21	□ □ □ ■ □ ■ □ ■	-21	■ □ □ ■ □ ■ □ ■
+22	□ □ □ ■ □ ■ ■ □	-22	■ □ □ ■ □ ■ ■ □
+23	□ □ □ ■ □ ■ ■ ■	-23	■ □ □ ■ □ ■ ■ ■
+24	□ □ □ ■ ■ □ □ □	-24	■ □ □ ■ ■ □ □ □
+25	□ □ □ ■ ■ □ □ ■	-25	■ □ □ ■ ■ □ □ ■
+26	□ □ □ ■ ■ □ ■ □	-26	■ □ □ ■ ■ □ ■ □
+27	□ □ □ ■ ■ □ ■ ■	-27	■ □ □ ■ ■ □ ■ ■
+28	□ □ □ ■ ■ ■ □ □	-28	■ □ □ ■ ■ ■ □ □
+29	□ □ □ ■ ■ ■ □ ■	-29	■ □ □ ■ ■ ■ □ ■
+30	□ □ □ ■ ■ ■ ■ □	-30	■ □ □ ■ ■ ■ ■ □

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1.1.6 Trailing registration adjustment

This adjustment corrects drifts in the image feed direction.

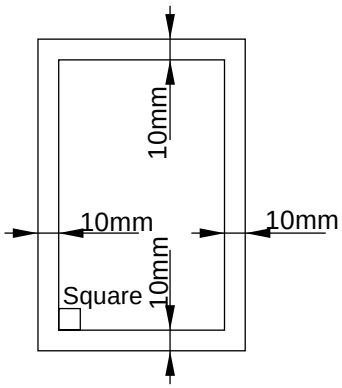
Two modes of adjustment available are:

- Adjusting from the host set in service mode
- Adjusting from the ADF controller PCB

Memo

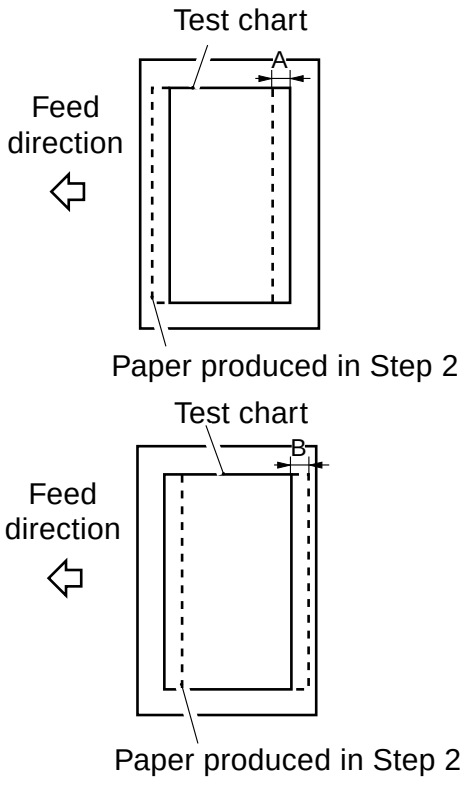
Adjustment would be easier to carry out from the host set in service mode.

1) Create a test chart shown at right using an A4 or LTR sheet of paper.



F05-101-15

2) Set the test chart created in the document tray and print it in equal size.
3) Check to see if size A in the test chart and size B in the image produced in Step 2) comply with the following tolerances:
   A ≦ 1mm
   B ≦ 1mm



F05-101-16

[If out of tolerances]

a. Adjusting from the host set in service mode

1) Turn on the power to the host to invoke service mode.
2) Press ✳, 2 and 8 concurrently, and then ✳ to invoke service mode.
3) Starting from the service mode screen, touch the following screens in this order:
   FEEDER>ADJUST>DOCST
4) Find out the optimal value by trying various possible values.
   Integer unit 1=0.5mm
   - The image appears shifted to left
     -> Increase the value.
   - The image appears shifted to right
     -> Reduce the value.
5) Print the test chart once again to see if the resultant image conforms to the specifications.

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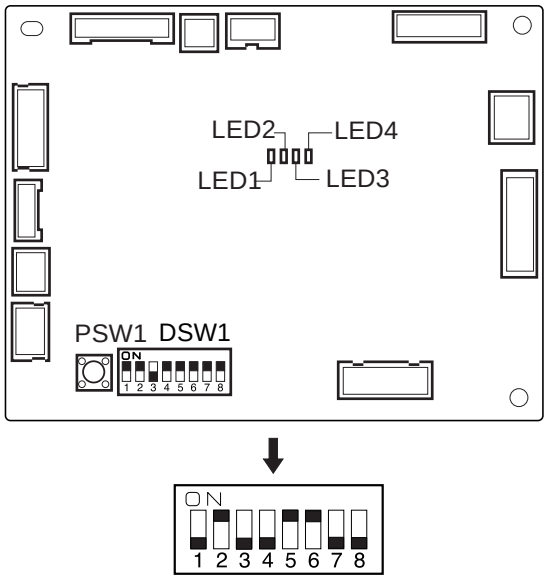
b. Adjusting from the ADF controller PCB

1) Detach the rear cover.
2) Set the DIP switch (DSW1) on the ADF controller PCB as illustrated and press the push switch (PSW1) to let the ADF into trailing registration adjustment mode.



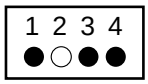
F05-101-17

When trailing registration adjustment mode sets in, ADF controller PCB LED2 will display the current setting. A setting is displayed in the order of the sign, tens place, and ones place, depending on the mix of the LED2 flashing speed and the flashing count.

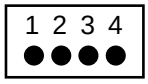
1. LED2 lit for 2 seconds: Start of display
2. LED2 off for 1 second
3. Quick display of the sign of the setting (at 0.1 second intervals)
   LED2 flashes twice to indicate positive (+), or once to indicate negative (-).
4. Flashing slowly the number of times specified by the tens place (at 0.8 second intervals)
5. Flashing slowly the number of times specified by the ones place (at 0.2 second intervals)

○ : On ◎ : Flashing ● : Off

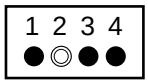
1. LED2 on for 2 seconds



2. LED2 off for 1 second

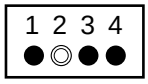


3. Sign of the setting
   Flashing once denotes (-)
   (at 0.1 second intervals).



4. Tens place of the setting
   No display

5. Ones place of the setting
   Flashing five times
   indicates five
   (at 0.2 second intervals).



* If the setting is positive (+), all LEDs will flash twice quickly in 3.

F05-101-18

3) Enter a trailing end registration setting with ADF controller PCB DIP switch (DSW1). Enter a setting in binary. Bit 1 designates a positive (+) value when OFF, a negative (-) value when ON.
   - Adjustment range: ±10
   - +1 slows the image start signal output timing by 0.5mm.

□ : Switch OFF ■ : Switch ON

Setting	Bit number 1 2 3 4 5 6 7 8	Setting	Bit number 1 2 3 4 5 6 7 8
+1	□ □ □ □ □ □ □ ■	-1	■ □ □ □ □ □ □ ■
+2	□ □ □ □ □ □ ■ □	-2	■ □ □ □ □ □ ■ □
+3	□ □ □ □ □ □ ■ ■	-3	■ □ □ □ □ □ ■ ■
+4	□ □ □ □ □ ■ □ □	-4	■ □ □ □ □ ■ □ □
+5	□ □ □ □ □ ■ □ ■	-5	■ □ □ □ □ ■ □ ■
+6	□ □ □ □ □ ■ ■ □	-6	■ □ □ □ □ ■ ■ □
+7	□ □ □ □ □ ■ ■ ■	-7	■ □ □ □ □ ■ ■ ■
+8	□ □ □ □ ■ □ □ □	-8	■ □ □ □ ■ □ □ □
+9	□ □ □ □ ■ □ □ ■	-9	■ □ □ □ ■ □ □ ■
+10	□ □ □ □ ■ □ ■ □	-10	■ □ □ □ ■ □ ■ □

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4) Press the push switch (PSW1) to update the setting as it is displayed by the LED indicator.
5) Print the test chart again to make sure that the image falls within tolerances of the specifications.
6) When the adjustment is completed, set all ADF controller PCB DIP switch (DSW1)bits to OFF.

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1.2 Making Adjustments Following Replacement of Key Parts

1.2.1 Overview

Key part	Action	Reference page
• ADF controller PCB	[1] Scanning speed adjustment	P.5-11
	[2] Leading registration adjustment	P.5-16
	[3] Tray width detection variable resistor adjustment	P.5-23
• Document width detection variable resistor (VR)	[1] Tray width detection variable resistor adjustment	P.5-23

T05-102-01

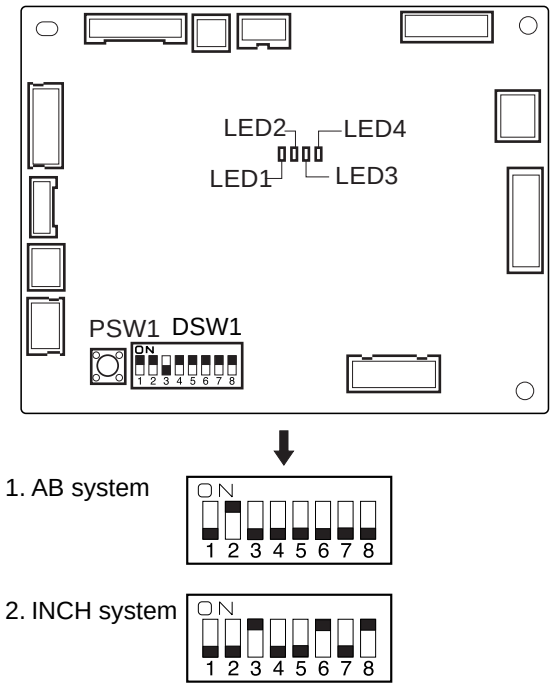
1.2.2 Tray width detection variable resistor adjustment mode

Perform this adjustment when the following parts have been replaced:

- ADF controller PCB
- Document width detection variable resistor

[Operating procedure]

1) Detach the rear cover.
2) Set the DIP switch (DSW1) on the ADF controller PCB as illustrated and press the push switch (PSW1) to let the ADF into tray width detection variable resistor adjustment mode.
   Perform 1 for the AB system, 2 for the inch system, or either 1 or 2 for the AB/inch system.



F05-102-01

3) The start of tray width detection variable resistor adjustment mode is signified by LED2 flashing slowly for the AB system or by LED4 flashing slowly for the inch system.
4) Set the following kinds of paper in the document pickup tray, adjust the slide, and press push switch (PSW1).
   - AB system: A3 or A4
   - Inch system: 11X17 or LTR

   Pressing push switch (PSW1) will cause LED2 to flash fast for AB system or LED4 to flash fast for the inch system.
5) Set the following kinds of paper in the document pickup tray, adjust the slide, and press the push switch (PSW1).
   - AB system: A5R
   - Inch system: LTRR or STMT
7) When the writing of the adjustment value ends, the LED goes off, and the tray width detection variable resistor adjustment mode exits.
8) When the adjustment is completed, set all ADF controller PCB DIP switch (DSW1) bits to OFF.

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2. Troubleshooting

2.1 Corrective Actions by Fault

2.1.1 E420 lit

ADF controller PCB

1) Replace the ADF controller PCB.

2.1.2 E421 lit

ADF controller PCB

1) Replace the ADF controller PCB.

2.1.3 E422 lit

Communication cable

1) Is the communication cable between the host and the ADF connected properly?

NO: Correct the cable connection.

Connector connection

2) Is ADF controller PCB connector (J1) connected properly?

NO: Correct the cable connection.

Cable, ADF controller PCB

3) Is the cable leading from ADF controller PCB connector (J1) to communication cable connected properly?

NO: Correct the cable connection.

YES: Replace the ADF controller PCB.

2.1.4 Black streaks appearing in a printed image in the sub scanning direction

Foreign matter on the scanning glass

1) Clean according to the suggested cleaning items. (See P.4-4.)

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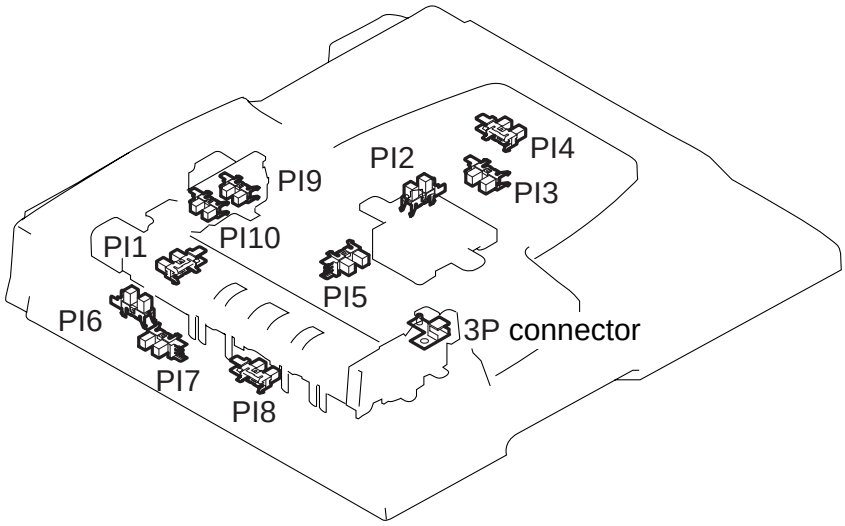
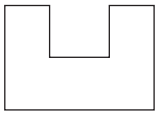
3. Electrical Parts Layout

3.1 Sensors



F05-301-01

Symbol	name	Symbol	Function
	Photointerrupter	PI1	ADF open/closed sensor
		PI2	A4R/LTRR identification sensor
		PI3	Tray sensor 1
		PI4	Tray sensor 2
		PI5	End-of-document sensor
		PI6	Registration roller paper sensor
		PI7	Read sensor
		PI8	Delivery reversal sensor
		PI9	Cover open/closed sensor
		PI10	Document set sensor
	Document Set LED	LED	Document presence/absence indicator

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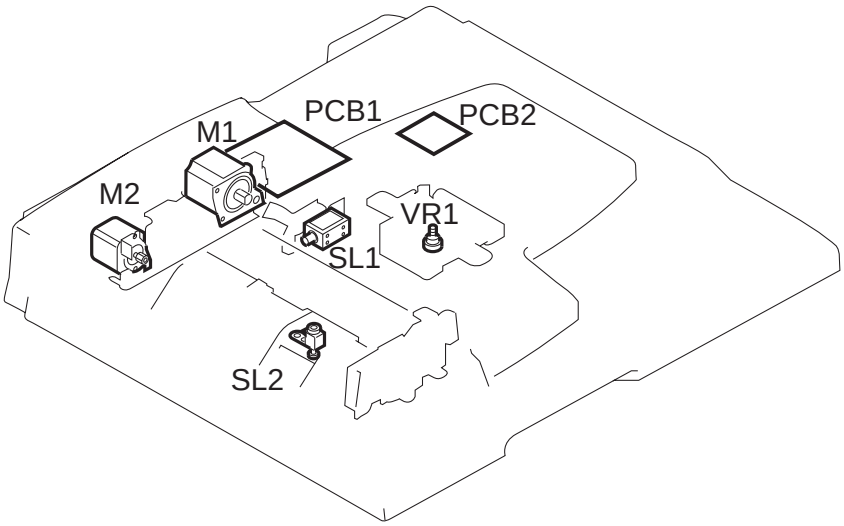
3.2 Motors, clutches, solenoids, PCB, etc.



F05-302-01

Symbol	name	Symbol	Function
M	Motor	M1	Feed motor
		M2	Pickup motor
SL	Solenoid	SL1	Locking solenoid
		SL2	Stamp solenoid
	ADF controller PCB	PCB1	ADF control
	Junction PCB	PCB2	Document pickup tray sensor relaying
	Variable resistor	VR1	Document width detection

T05-302-01

4 LEDs, Check Pins, and Switches by PCB

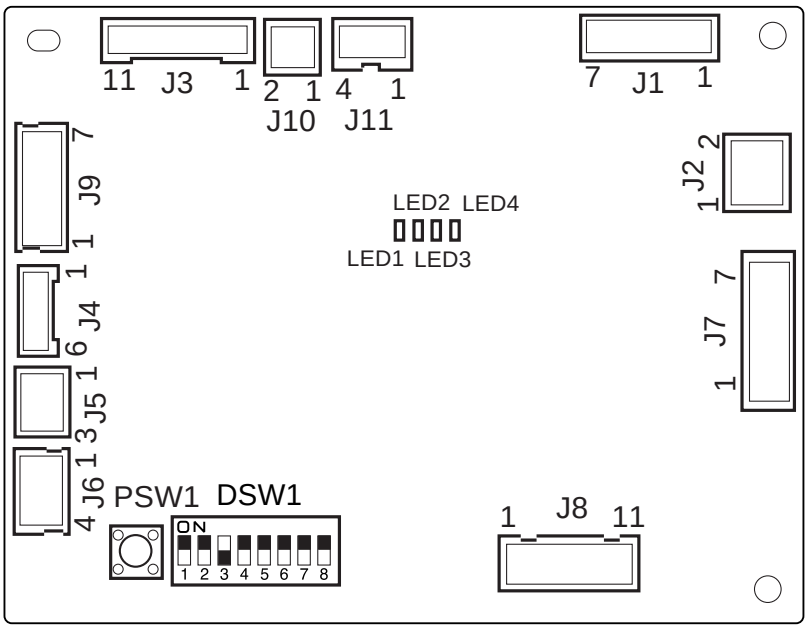
Among the LEDs, check pins, and switches that are mounted on this ADF, only those that are required for surviving it in the field are mentioned below.

Check pins that are not mentioned on the list are intended for factory use only. Special tooling and instrumentation are required to make adjustments and checks using these check pins. These pins require critical accuracy and must not be touched in the field.

4.1 ADF Controller PCB

Some LEDs illuminate slightly even when off, because they carry leak current under normal conditions of operation. These LEDs should not be recognized as signifying faults.

4.1.1 Component layout



F05-401-01

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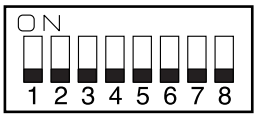
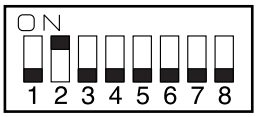
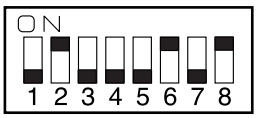
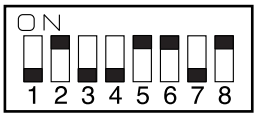
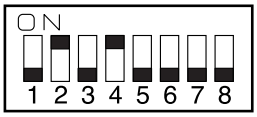
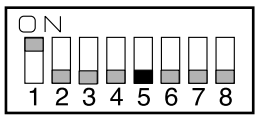
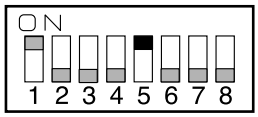
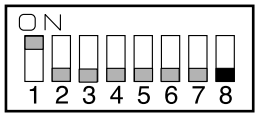
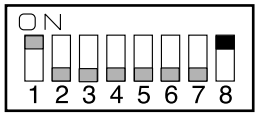
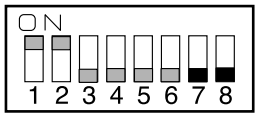
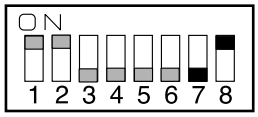
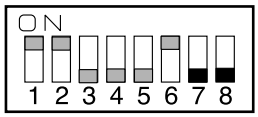
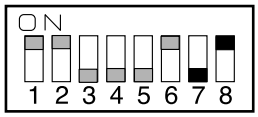
4.1.2 DIP switch function list

The functions of the ADF controller PCB DIP switch (DSW1) are summarized below.

T05-401-01

Function	DIP switch setting	Contents
Normal operation		Normal operating state
Adjustment		Tray width detection variable resistor adjustment (AB system)(See P.5-17.)
		Tray width detection variable resistor adjustment (inch system)(See P.5-17.)
		Scale adjustment (first side)(See P.5-11.)
		Scale adjustment (second side)(See P.5-11.)
		Trailing registration adjustment (See P.5-13.)
		Registration cleaning (See P.4-5.)

Function	DIP switch setting	Contents
Operational verification		High-speed operation Press the push switch (PSW1) to let the ADF perform a pickup operation continuously.
		Single-sided operation
		Double-sided operation
		No stamp
		Stamp
		Durability mode Press the push switch (PSW1) to let the ADF run continuously. Run the ADF without paper loaded, since a timing has not been detected.
		33 ipm equivalent (Start => Stop)
		25 ipm equivalent (Start => Stop)
		Feed motor operation test Press the push switch (PSW1) to let the ADF run continuously. Run the ADF without paper loaded, since a timing has not been detected.
		Forwarding (70=>140=>280=>0)
		Reversing (70=>140=>280=>0)

T05-401-02

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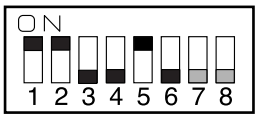
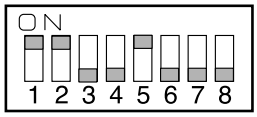
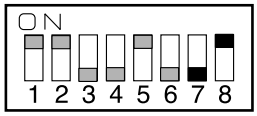
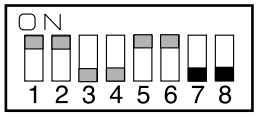
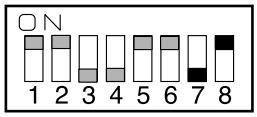
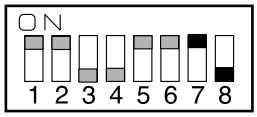
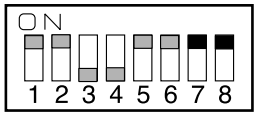
Function	DIP switch setting	Contents
Operational verification		Pickup motor operation test Press the push switch (PSW1) to let the ADF run continuously. Run the ADF without paper loaded, since a timing has not been detected.
		Forwarding (70=>140=>280=>0)
		Reversing (70=>140=>280=>0)
		Solenoid actuation test There are two modes of operation available: ON/OFF mode, in which the solenoid turns on and off alternately each time the push switch (PSW1) is pressed, and continuous mode, in which the solenoid turns on only while PSW1 is pressed.
		Locking solenoid (ON/OFF)
		Stamp solenoid (ON/OFF)
		Locking solenoid (continuous)
		Stamp solenoid (continuous)

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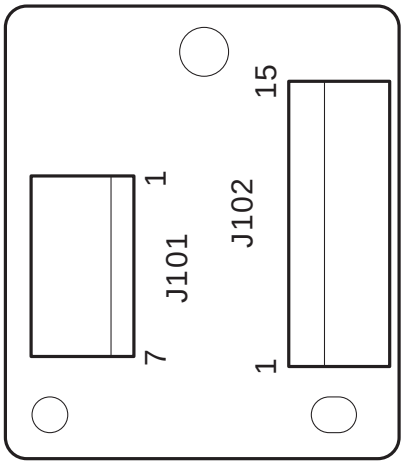
4.2 Junction PCB



F05-402-01

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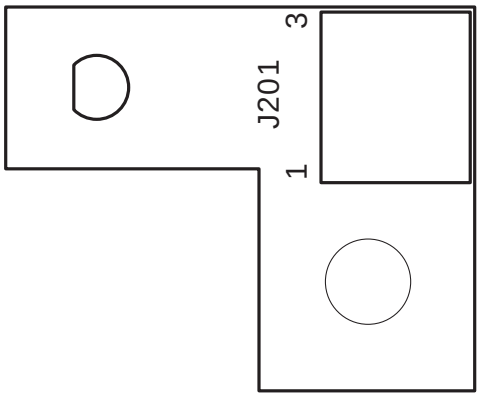
4.3 Document Set LED PCB



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5. Self-Testing

5.1. Overview

This ADF supports a self-testing capability, which is implemented by the CPU mounted on the ADF controller PCB. It carries on testing constantly and, when errors are established, flashes the Document Set to alert the user to them and transmitting the corresponding error codes to the host. Three kinds of information may be transmitted as described below. These are identified by the Document Set LED and ADF controller PCB LEDs.

Description	Document Set LED flashing state	ADF controller PCB LED display state
Alarm	Flashing at 240 msec intervals	
Jam	Flashing at 160 msec intervals	
Error	Flashing at 80 msec intervals	

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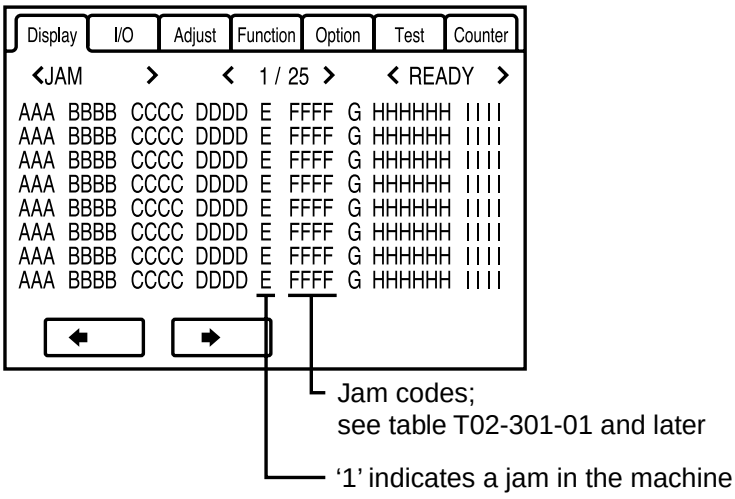
When alarms or jams occur, their codes can be viewed by setting the host in service mode. When errors occur, the corresponding error codes are displayed on the host screen.



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5.2 Alarms

Alarm codes are displayed on the display screen on the host set in service mode.

Display code	Error symptom	Host operation	Host operation	Reset
03xx	The separation of the first sheet of a document failed (read sensor delay jam, or document registration roller paper sensor delay jam).	Stops running and flashes the Document Set LED.	Stop	Remove the document, then set it in position again.
11xx	No document is available in the tray to complete the transfer of the number of sheets to be recovered during a jam recovery operation.	Stops running and flashes the Document Set LED.	Stop	Set the document again in original condition.
13xx	The read sensor turned OFF after the leading sheet of the document had been fed to the scanning position.	Stops running and flashes the Document Set LED.	Stop	Remove the document, then set it in position again

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5.3 Jams

For definitions of jams, see Section 3, “Jams,” in Chapter 2 (P.2-37).

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5.4 Errors

Error indications can be viewed on the display screen on the host.

The table below lists the codes that may be displayed on the host screen, along with their definitions.

E420	
Main causes	• ADF controller PCB fault • EEPROM error
How to detect	• Backup data could not be read or backup data read was found in error when the power to the to the host was turned on.
E421	
Main causes	• ADF controller PCB fault • EEPROM error
How to detect	• Backup data could not be written to EEPROM.
E421	
Main causes	• ADF controller PCB fault • EEPROM error
How to detect	• Backup data written to EEPROM was found in error.
E422	
Main causes	• IPC communication error • Disrupted communication line • ADF controller PCB fault
How to detect	• Communication between the ADF and the host has been interrupted for 5 seconds or longer while the ADF stood by. • Communication between the ADF and the host has been interrupted for 0.5 second or longer while the ADF was running.

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5.5 Host I/O Displays

Address	Bit	Display	Signal name	Connector	Remarks
IO-P01	Bit 0	–			
(output)	Bit 1	–			
	Bit 2	–			
	Bit 3	–			
	Bit 4	–			
	Bit 5	Document Set LED	LED	J11-4	L:ON
	Bit 6	Locking solenoid	A_SL	J10-1	L:ON
	Bit 7	Stamp solenoid	STAMP_SL	J11-2	L:ON
IO-P02	Bit 0	Delivery sensor	EJTS	J3-12	H: Paper present
(input)	Bit 1	Read sensor	READS	J3-9	H: Paper present
	Bit 2	Registration roller paper sensor	REGS	J3-6	H: Paper present
	Bit 3	ADF open/closed sensor	ADFOPS	J3-3	H: Open
	Bit 4	Pickup motor phase output (output)	M2A	J8-3	
	Bit 5	Pickup motor phase output (output)	M2A*	J8-4	
	Bit 6	Pickup motor phase output (output)	M2B	J8-5	
	Bit 7	Pickup motor phase output (output)	M2B*	J8-6	
IO-P03	Bit 0	–			
(input)	Bit 1	–			
	Bit 2	Image start signal	EDGO	J1-2	
IO-P04	Bit 0	EEPROM Data input			
	Bit 1	EEPROM data output			
	Bit 2	EEPROM clock	EEPROM_CK		
	Bit 3	EEPROM Chip Select	EEPROM_CS		
	Bit 4	Document sensor	EMPS	J4-3	H: Paper present
	Bit 5	Cover open/closed sensor	COVERS	J4-6	L: Open
	Bit 6	Feed motor clock			
	Bit 7	Pickup motor clock			
IO-P05	Bit 0	Document width detection variable resistor	VR	J6-4	
(input)	Bit 1	End-of-document sensor	ENDS	J6-3	H: Paper present
	Bit 2	Document length sensor 2	LENG2S	J6-2	H: Paper present
	Bit 3	Document length sensor 1	LENG1S	J6-1	H: Paper present
	Bit 4	A4R/LTR identification sensor	A4R/LTR	J5-3	H: A4R
	Bit 5	Push switch	SKHHPK		
	Bit 6	Feed motor	Vref RMOT_V-REF		
	Bit 7	Pickup motor	Vref KMOT_V-REF		

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Address	Bit	Display	Signal name	Connector	Remarks
IO-P06	Bit 0	Feed motor phase output	M1A	J7-3	
(output)	Bit 1	Feed motor phase output	M1A*	J7-4	
	Bit 2	Feed motor phase output	M1B	J7-5	
	Bit 3	Feed motor phase output	M1B*	J7-6	
	Bit 4	–	–	–	
	Bit 5	–	–	–	
	Bit 6	Read sensor (1)	READS	J3-9	H: Paper present
IO-IPC09	Bit 0		LED4		
(output)	Bit 1		LED3		
	Bit 2		LED2		
	Bit 3		LED1		
	Bit 4	–	–	–	
	Bit 5	–	–	–	
	Bit 6	–	–	–	
	Bit 7				
IO-IPC10	Bit 0		DIP SW8		
(Input)	Bit 1		DIP SW7		
	Bit 2		DIP SW6		
	Bit 3		DIP SW5		
	Bit 4		DIP SW4		
	Bit 5		DIP SW3		
	Bit 6		DIP SW2		
	Bit 7		DIP SW1		
AD-P01 (analog port)		Document width detection variable resistor (analog)			
AD-P02 (analog port)		Feed motor current value			
AD-P03 (analog port)		Pickup motor current value			

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APPENDIX

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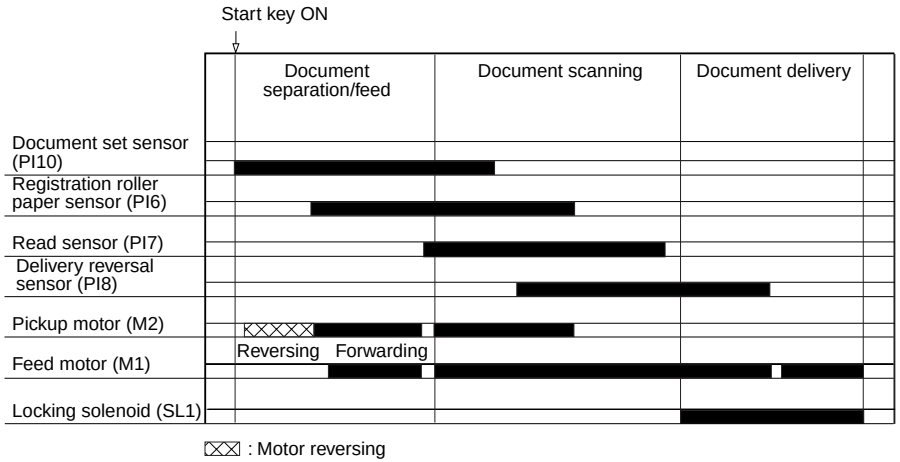
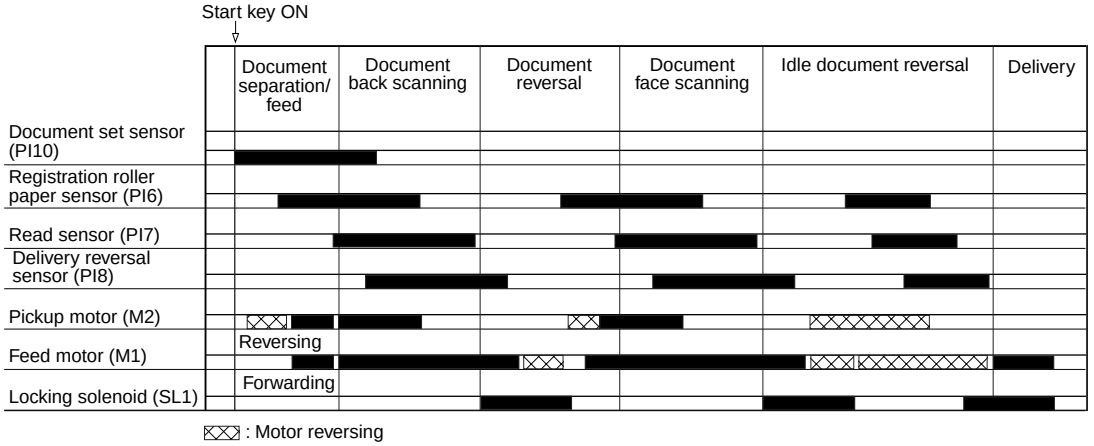
1 General Timing Charts

1.1 Flow-Scanning a Single-sided A4 Document



1.2 Scanning a Double-sided A4 Document, Face First, Back Next



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2 Signal Name/Designation List

Definitions of the signal names and other designations used in this chapter and in the block diagrams are listed below.

Note: Designations in brackets denote an electrical signal, or an analog signal whose state cannot be represented as a 0 or 1. Other designations denote a digital signal whose state can be represented as a 0 or 1.

A4R/LTR	A4R/LTRR Identification signal
ADFOPS	ADF Open/Closed Detection signal
A_SL	Locking Solenoid Drive signal
COVERS	Feeder Cover Open/Closed Detection signal
EJTS	Delivery Reversal Detection signal
EMPS	Document Set Detection signal
ENDS	End-of-Document Detection signal
LED	Document Set LED signal
LENG1S	Document Length Detection signal 1
LENG2S	Document Length Detection signal 2
M1A	Feed Motor Drive signal
M1A*	Feed Motor Drive signal
M1B	Feed Motor Drive signal
M1B*	Feed Motor Drive signal
M2A	Pickup Motor Drive signal
M2A*	Pickup Motor Drive signal
M2B	Pickup Motor Drive signal
M2B*	Pickup Motor Drive signal
READS	Read Document Detection signal
REGS	Registration Roller Paper Detection signal
STAMP_SL	Stamp Solenoid Drive signal
VR	Document Width Detection signal

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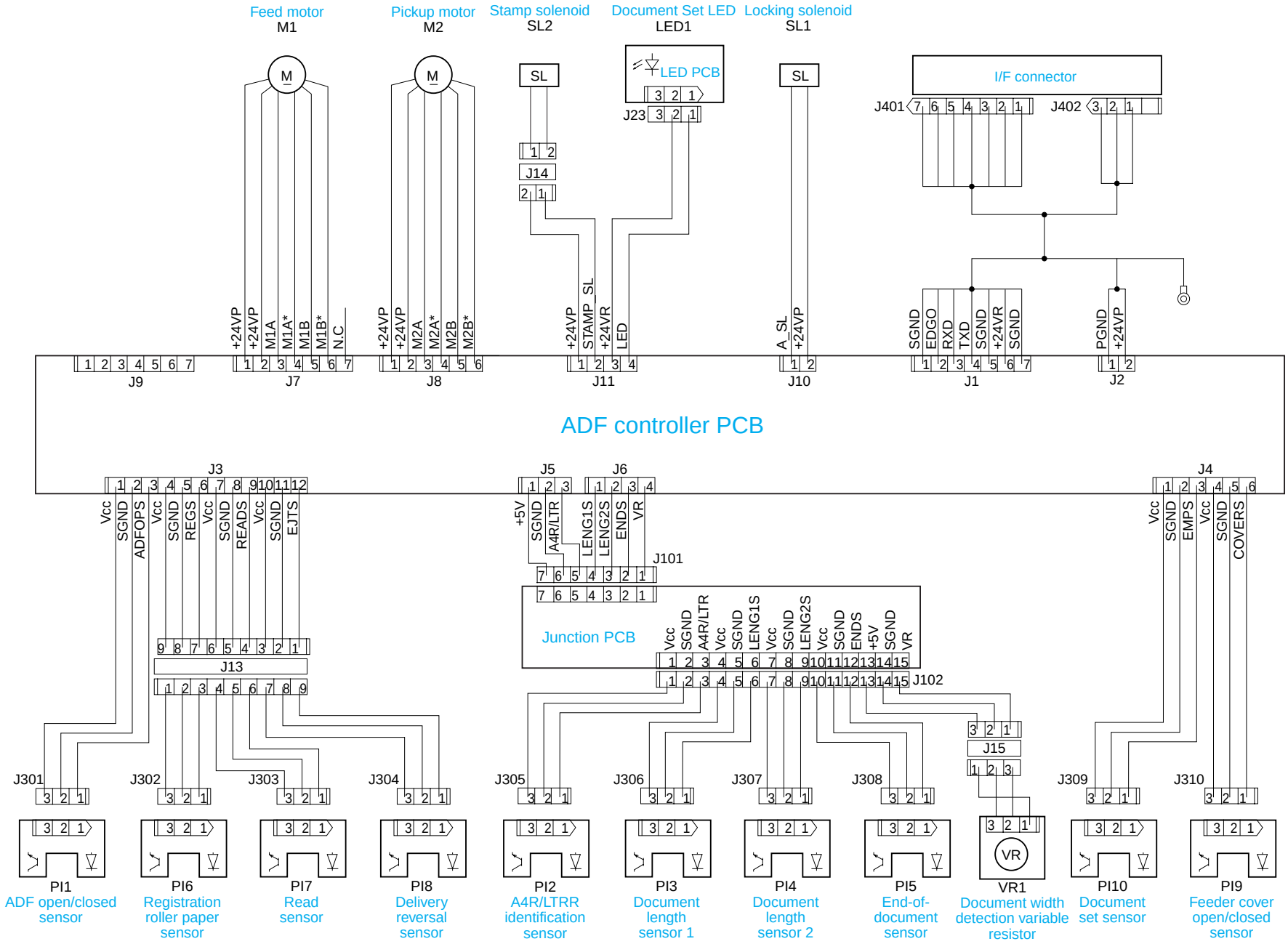

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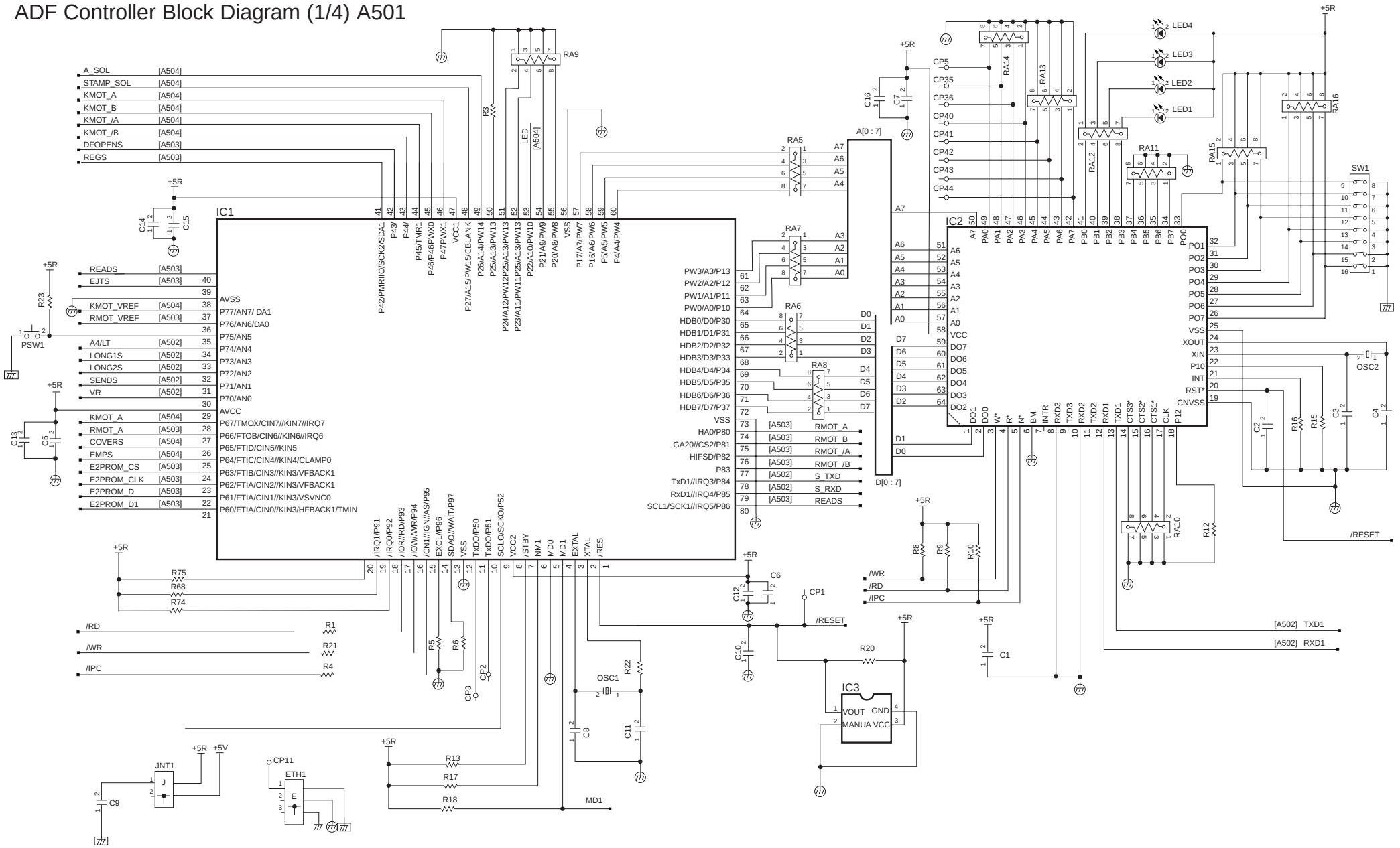
ADF Controller Block Diagram (1/4) A501



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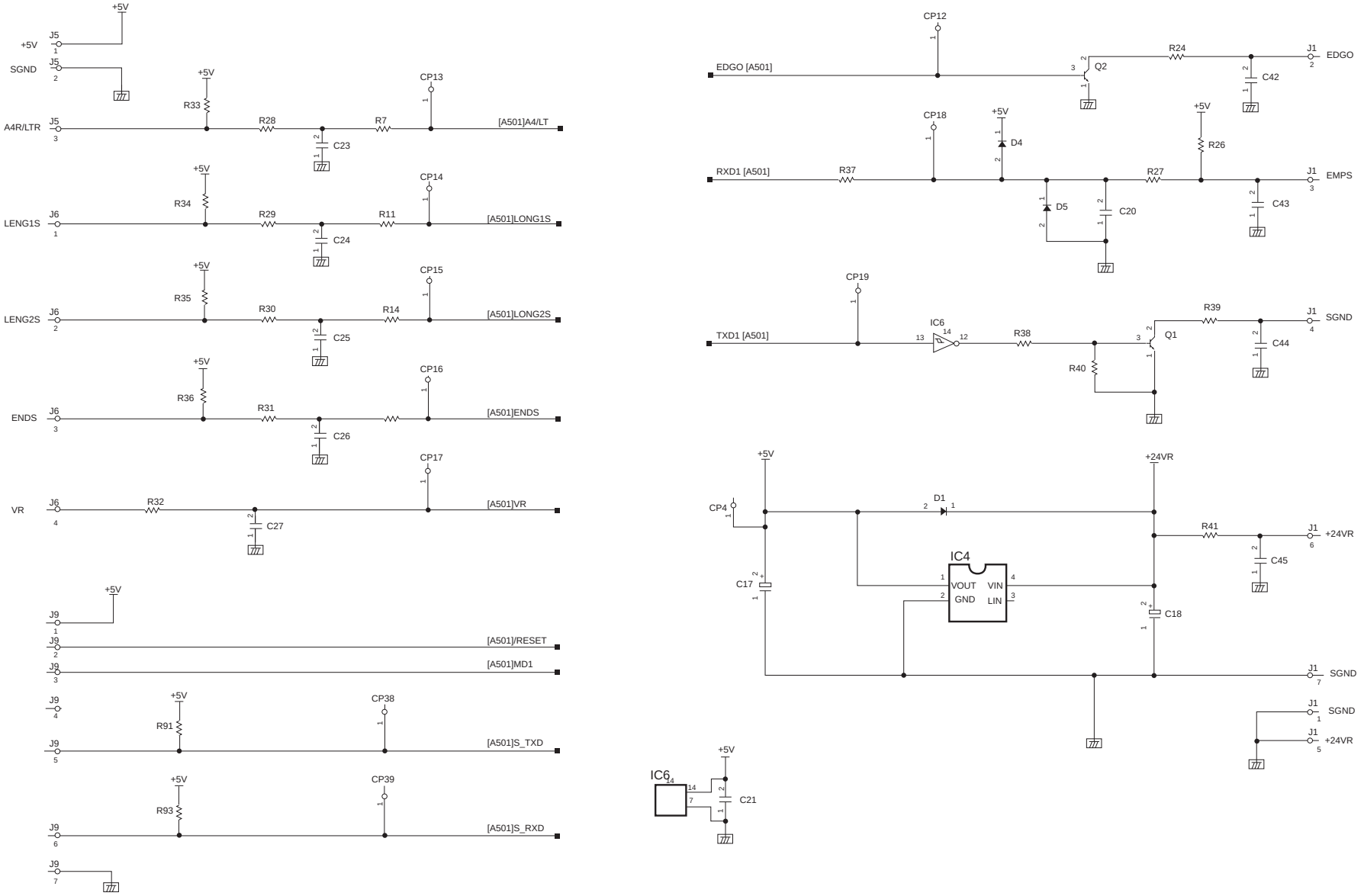
ADF Controller Block Diagram (2/4) A502



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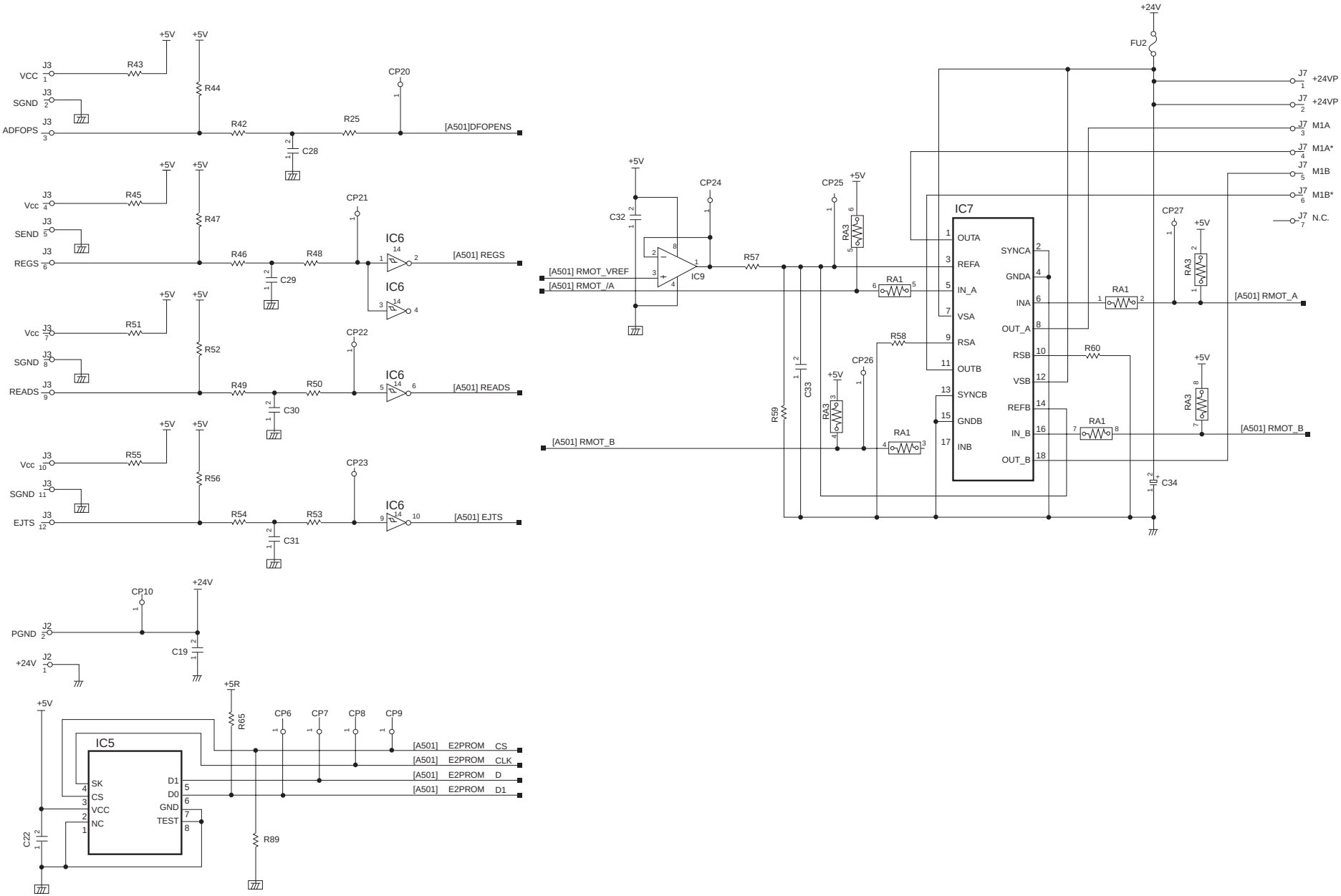
ADF Controller Block Diagram (3/4) A503



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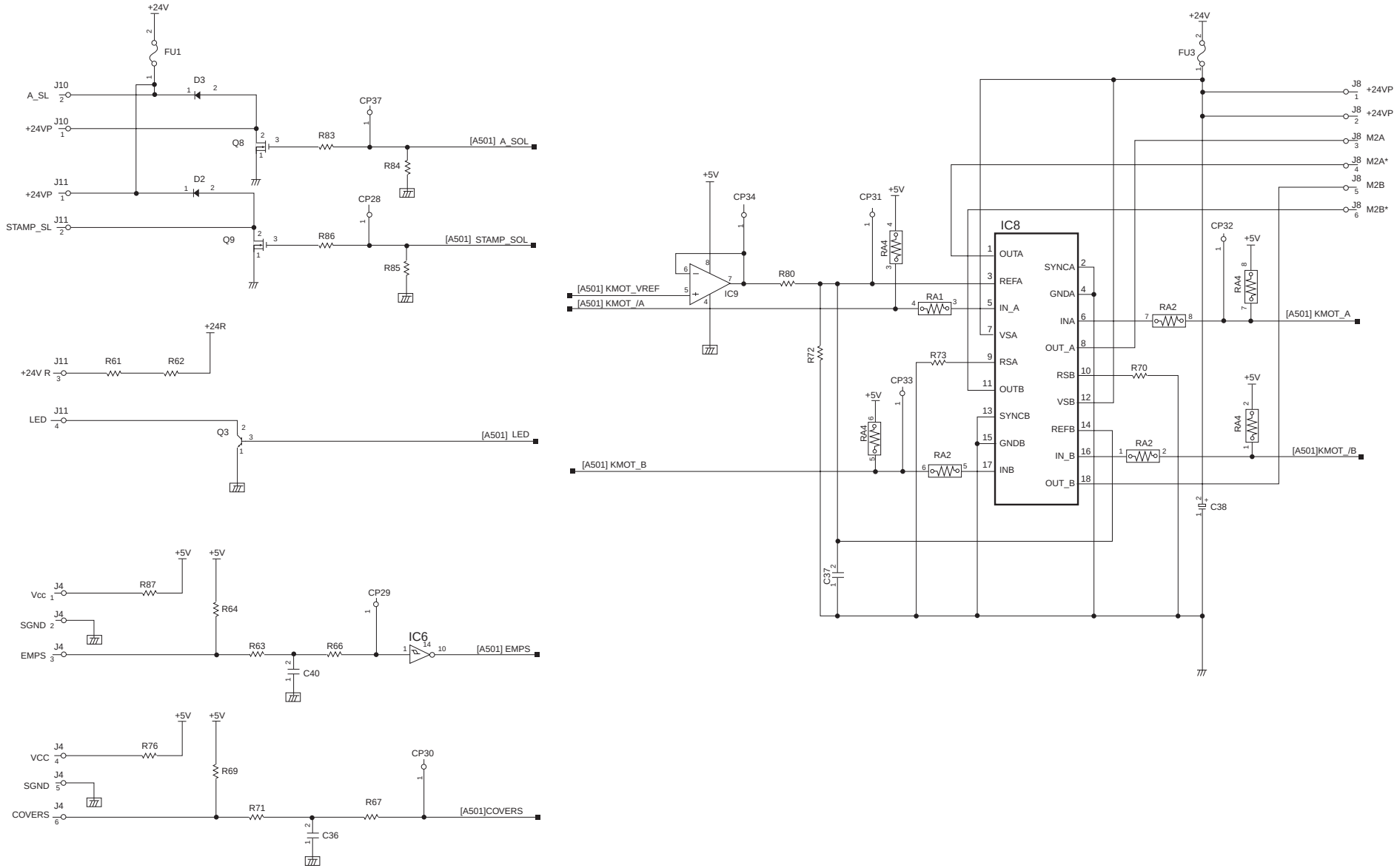
ADF Controller Block Diagram (4/4) A504



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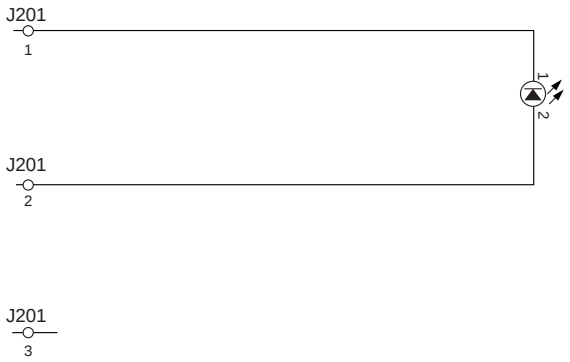
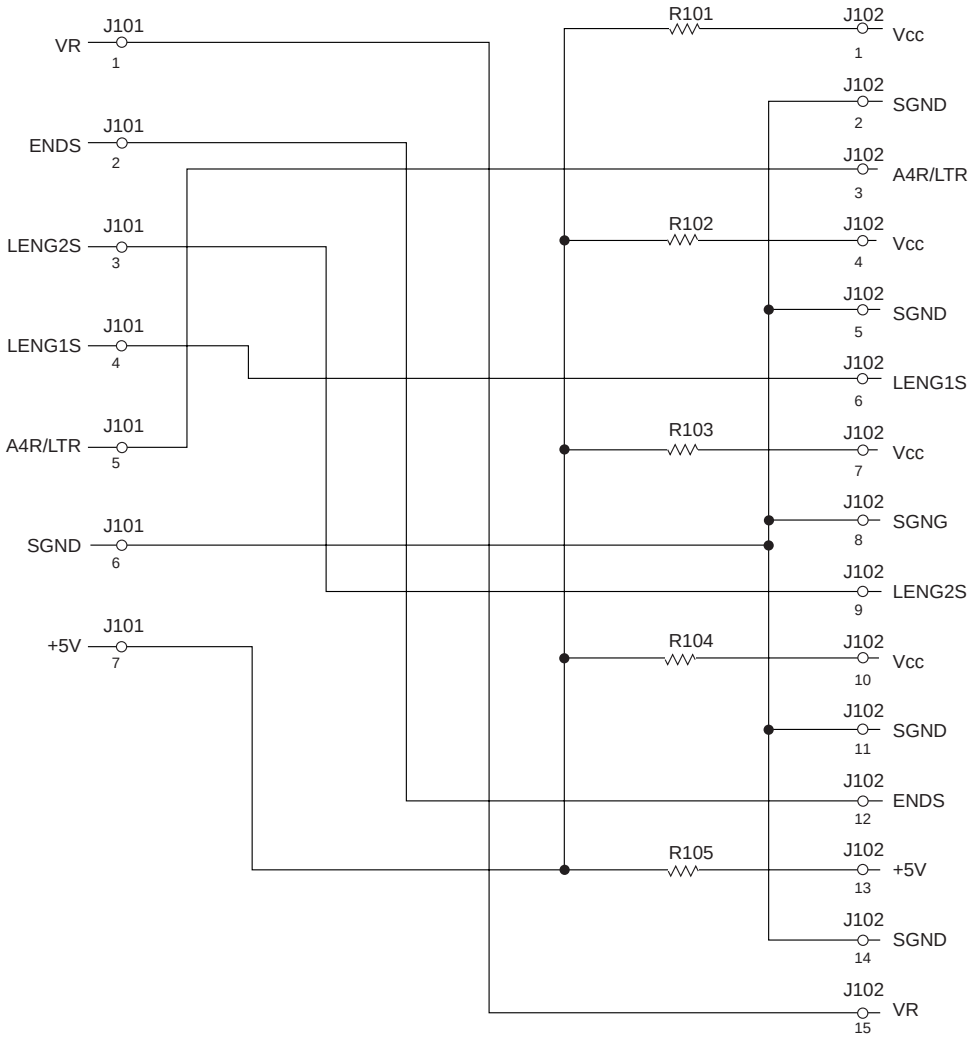
5 Document Set Display Block Diagram



6 Junction PCB Block Diagram



7 Jam Code List

No.	Jam Code	Explanation
1	0001	Registration roller sensor delay jam
2	0002	Registration roller sensor stack jam
3	0003	Read sensor delay jam
4	0004	Read sensor stack jam
5	0005	Delivery sensor delay jam
6	0006	Delivery sensor stack jam
7	0007	ADF open jam
8	0008	User ADF open jam
9	0009	ADF cover open jam
10	000A	User ADF cover open jam
11	000B	Initial stack jam
12	000C	Pickup failure

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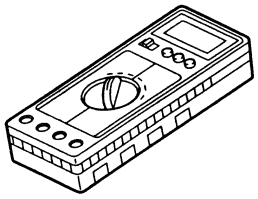
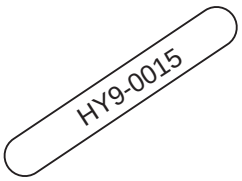
8 Special Tools List

The table below lists the special tools, other than those included in the standard tool set, that are required for servicing this machine.

NO.	Tool Name	Tool No.	Shape	Rank	Use/Remarks
1	Digital multimeter	FY9-2002-000		A	Electrical checking, etc.
2	Gauge (1.4 mm gap)	HY9-0015-000		A	Platen guide L gap adjustment

Note: Ranks
A: Each service engineer should be equipped with one unit of this tool.
B: One unit of this tool need be maintained for each group of five or so.
C: One unit of this tool need be maintained in each workshop.

9 Solvent/Grease List

No.	Name	Use	Formulation	Remarks
1	BYUKKURIN C-17	Cleaning Examples: Glass, plastic materials, rubber, exterior covers	Hydrofluorocarbon Alcohols Surfactant Water	- Keep away from fire. - To be adjusted in the field. - Substitute: IPA (Isopropyl alcohol)
2	Lubricant	Driving and sliding parts	Silicone oil	- PERMALB 82 - Tool No. CK-0551 (20g)

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